

**From:** Whittaker, Laura [laura.whittaker@aptim.com]  
**Sent:** Thursday, August 9, 2018 5:08 AM  
**To:** Liscio, Matthew P CIV SEA 04, NAVSEA DET RASO [matthew.liscio@navy.mil]  
**CC:** Slack, Matthew L CIV SEA 04 04N [matthew.slack@navy.mil]; Howard, Leslie A CIV NAVFAC SW [leslie.howard@navy.mil]; Noble, Kimberly K CIV SEA 04, NAVSEA DET RASO [kimberly.k.noble1@navy.mil]; Johnson, Nels [Nels.Johnson@aptim.com]; Schul, Raymond [raymond.schul@aptim.com]; Guillory, Jeffrey [jeffrey.guillory@aptim.com]; Meldrum, Amy [amy.meldrum@aptim.com]; Hanelt, Norm [Norm.Hanelt@aptim.com]; Killpack, Randall [randall.killpack@aptim.com]; Gerg, David [david.erg@aptim.com]; Chi, Minhsec [minhsec.chi@aptim.com]; Orman, Sean [sean.orman@aptim.com]; Rogers, Bryon [bryon.rogers@aptim.com]  
**Subject:** [Non-DoD Source] Data package ready for review - HPNS PE-2, RSY B6 (Use 8)  
**Attachments:** HPNS APTIM RSY B6 (Use 8) Soil Non-LLRW Concurrence Request 08092018 (reduced).pdf

Mr. Liscio,

APTIM request RASO concurrence to designate this soil as Non-LLRW soil.

If there are any questions or if additional data is required, please contact me.

Thank you.



Laura Whittaker  
Senior Radiation Control Technician 4, Radiation Safety  
Cell: +423 544 9145  
[Laura.Whittaker@aptim.com](mailto:Laura.Whittaker@aptim.com)

APTIM  
Hunters Point Naval Shipyard  
200 Fisher Avenue  
San Francisco, CA 94124



## Hunters Point Naval Shipyard, Parcel E-2 RSY Data Report

Contract No. EMAC III CTO-0013						
RSY Pad: B6	RSY Pad Use Number: USE 8	First Submittal <input checked="" type="checkbox"/>	Second Submittal <input type="checkbox"/>			
Data attached and submitted by: Laura Whittaker		Data Report Submittal Date: 08/09/2018				

Soil Sample Data						
Sample Identification	Survey Location	Type of Sample	<sup>226</sup> Ra Final Analytical Results (pCi/g)	<sup>137</sup> Cs Final Analytical Results (pCi/g)	<sup>60</sup> Co Final Analytical Results (pCi/g)	Total Sr Final Analytical Results (pCi/g)
		Upper limit of site reference background	1.633	0.113	0.252	0.331
PE2-RSYB6-U8-S001	1	Systematic	0.181	0.0196	0.00865	0.0112
PE2-RSYB6-U8-S002	2	Systematic	0.449	-0.0225	0.0203	N/A
PE2-RSYB6-U8-S003	3	Systematic	0.500	0.00539	0.0108	N/A
PE2-RSYB6-U8-S004	4	Systematic	0.611	-0.0273	0.0136	N/A
PE2-RSYB6-U8-S005	5	Systematic	0.635	-0.0530	0.0268	N/A
PE2-RSYB6-U8-S006	6	Systematic	0.440	-0.0116	-0.0198	N/A
PE2-RSYB6-U8-S007	7	Systematic	0.592	-0.0372	0.0325	N/A
PE2-RSYB6-U8-S008	8	Systematic	0.629	0.00565	0.0292	N/A
PE2-RSYB6-U8-S009	9	Systematic	0.503	0.0184	0.00573	N/A
PE2-RSYB6-U8-S010	10	Systematic	0.286	-0.0792	0.0609	N/A
PE2-RSYB6-U8-S011	11	Systematic	0.492	-0.0392	-0.0114	0.0632
PE2-RSYB6-U8-S012	12	Systematic	0.135	-0.0507	-0.0681	N/A
PE2-RSYB6-U8-S013	13	Systematic	0.668	0.0336	-0.013	N/A
PE2-RSYB6-U8-S014	14	Systematic	0.526	-0.0491	0.0501	N/A
PE2-RSYB6-U8-S015	15	Systematic	0.767	0.0193	-0.00241	N/A
PE2-RSYB6-U8-S016	16	Systematic	0.485	-0.0523	0.0135	N/A
PE2-RSYB6-U8-S017	17	Systematic	0.429	0.0190	0.0249	N/A
PE2-RSYB6-U8-S018	18	Systematic	0.710	-0.0316	0.0105	N/A

<sup>137</sup>Cs Cesium-137  
<sup>60</sup>Co Cobalt-60  
<sup>226</sup>Ra Radium-226  
Sr Strontium  
pCi/g Picocuries per gram

Instrument and Survey Data										
Activity	Survey #	Date	Meter	Calibration Due Date	Serial #	Reference Area Static Bkgd	Reference Area Static 3σ IL	Reference Area Scan Bkgd	Reference Area Scan 3σ IL	Range
RSI Gamma Walkover Survey	HPRS-07022018-PE2-ROV2-2692	07/02/2018	RS-701/RSX-1	N/A	Console: 7236 Detectors: 5447,5448	N/A	N/A	3,400 CPS	4,872 CPS	3,023-3,747 CPS
RSI Follow-up Static Survey	HPRS-07102018-PE2-JSS2-2735	07/10/2018	RS-701/RSX-1	N/A	Console: 7236 Detectors: 5447,5448	3,612 CPS	4,255 CPS	N/A	N/A	3,241-3,986 CPS
Systematic Sample Survey	HPRS-07022018-PE2-JSS-2695	07/02/2018	2221	07/12/2018	271439	15,783 CPM	18,714 CPM	N/A	N/A	13,461-16,823 CPM

3σ IL Investigation Level (established at 3σ above the mean of the Reference Area dataset)

CPS Counts per second

CPM Counts per minute

Summary
1) RSI gamma walkover survey and data review—upon review of initial scan data, follow-up static investigations were deemed necessary, and investigation locations were identified as per the RSI Data Evaluation Process (pages 3-4). Gamma scan coverage is shown on the Systematic Sample Survey map (page 8). Contour maps of scan data are shown on RSI Data Plots (page 5). Data review results are summarized on RSI Review Summary (page 6).
2) RSI Follow-up static survey—25 locations identified during the data review process were investigated, with readings less than the Reference Area static IL at all locations for regions of interest (ROIs) 3, 6, 7, 8, and 9 (VD1). Follow-up locations are shown on the RSI Follow-up Static Survey map (page 7).
3) Eighteen systematic soil samples (001-018) were obtained and submitted for gamma spectroscopy analysis. Sample locations for systematic samples are shown on the Systematic Sample Survey map (page 8). TestAmerica sample results are attached (pages 37-60).  Ten percent of the systematic soil samples (two samples in total, PE2-RSYB6-U8-S001 & PE2-RSYB6-U8-S011) were also analyzed for total strontium. Total Strontium results are also included in the TestAmerica sample results report (pages 37-60).
<b>Conclusions:</b>  All locations with elevated Z-scores identified by the RSI gamma walkover survey were determined to be consistent with background. 25 locations were investigated during the follow-up static survey, with readings less than the Reference Area static IL at all locations for ROIs 3, 6, 7, 8, and 9 (VD1). Spectral analysis results and gamma static data for each region of interest (ROI) are provided (pages 9-33).  Final analytical results for systematic samples from this RSY pad are concluded to be comparable to background. Histograms showing soil sample activity concentrations are provided (pages 34-36). Ten percent of the systematic soil samples (two samples in total, PE2-RSYB6-U8-S001 & PE2-RSYB6-U8-S011) were also analyzed for total strontium, with concentrations less than the Project Action Limit of 0.331 pCi/g, as shown in the Soil Sample Data table (page 1).  RSY B6 (Use 8) contains soil from the Survey Units areas undergoing revetment construction.  APTIM request RASO concurrence to release this soil as Non-LLRW. Disposition: This soil shall be dispositioned as non-LLRW waste to be stockpiled onsite following appropriate chemical characterization.

## RSI Data Evaluation Process

### RS-700 Mobile Radiation Monitoring System

- Self-contained gamma-ray radiation detection and monitoring system
- (2) RSX-1 4-liter NaI(Tl) gamma detectors oriented perpendicular to the direction of travel (VD1 denotes both detectors summed; VD3 refers to the left detector; and VD4 refers to the right detector)
- Multi-Channel Analyzer, allowing for monitoring of energy-specific regions of interest (ROIs)
- RadAssist survey software for control, monitoring, and recording

Ten ROIs have been established for radium and progeny, cesium, and cobalt, as well as other naturally-occurring or anthropogenic gamma-emitting radionuclides that may be of interest:

ROI	Description	Energy Range (keV)	Primary Peak (keV)
1	Total counts	411 – 2811	N/A
2	Potassium	1371 – 1569	1460
3	U/Ra-226	1659 – 1860	1764 (Bi-214)
4	Thorium	2409 – 2811	2614 (Tl-208)
5	Annihilation	456 – 570	511
6	Ra-226	546 – 666	609 (Bi-214)
7	Cs-137	600 - 720	662
8	Pb-214/Ra-226	327 – 399	351
9	Co-60	1085 - 1370	1173/1332
10	Gross Counts	24 – 2811	N/A

A tiered approach is used during data review to identify follow-up locations. Raw data are exported to a comma delimited format using RadAssist and imported into an Excel spreadsheet for review and analysis. The following review steps are completed to determine if additional follow-up measurements are necessary:

- **Playback Review:** The data file is replayed in RadAssist and reviewed for elevated count rates in ROIs 6, 7, 9, and 10 for virtual detector (VD) 1 (both detectors summed). The scan screen is also monitored for elevated count rates and alarms.
- **Count Rate Time Series Review:** The count rates for ROIs 6, 7, 9, and 10 for VDs 1, 3 (detector 1), and 4 (detector 2) are plotted in a time series and reviewed for additional peaks in count rate.
- **All ROIs:**
  - **Z-Scores:** The Z-Scores are calculated for each location in all ROIs for VDs 1, 3, and 4. Any location with four or more ROIs having a Z-Score greater than three ( $Z>3$ ) is marked for follow-up.
  - **Local Z-Scores:** Local Z-Scores are calculated using a moving average for each data point in all ROIs for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) with four or more ROIs having a local  $Z>3$  is marked for follow-up.
  - **Semi-local Z-Scores:** Semi-local Z-Scores are calculated using the global average, but with a moving average for the standard deviation for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) with four or more ROIs having a semi-local  $Z>3$  is marked for follow-up.
- **ROIs 3, 6, 8, and 10 (radium-specific ROIs):**
  - Z-Scores: The Z-Scores are calculated for each location in the radium-specific ROIs for VDs 1, 3, and 4. Any location with three or more radium-specific ROIs having a  $Z>3$  is marked for follow-up.
  - Local Z-Scores: Local Z-Scores are calculated using a moving average for each data point in the radium-specific ROIs for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) with three or more radium-specific ROIs having a local  $Z>3$  is marked for follow-up.
  - Semi-local Z-Scores: Semi-local Z-Scores are calculated using the global average, but with a moving average for the standard deviation for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise

be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) with three or more radium-specific ROIs having a semi-local  $Z > 3$  is marked for follow-up.

- **ROI 7 (cesium-specific ROI):**
  - Z-Scores: Z-Scores are calculated for each location in ROI 7 for VDs 1, 3, and 4. Any location having a  $Z > 3$  is marked for follow-up.
  - Local Z-Scores: Local Z-Scores are calculated using a moving average for each data point in ROI 7 for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) having a local  $Z > 3$  is marked for follow-up.
  - Semi-local Z-Scores: Semi-local Z-Scores are calculated using the global average, but with a moving average for the standard deviation in ROI 7 for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) having a semi-local  $Z > 3$  is marked for follow-up.
- **ROI 9 (cobalt-specific ROI):**
  - Z-Scores: Z-Scores are calculated for each location in ROI 9 for VDs 1, 3, and 4. Any location having a  $Z > 3$  is marked for follow-up.
  - Local Z-Scores: Local Z-Scores are calculated using a moving average for each data point in ROI 9 for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) having a local  $Z > 3$  is marked for follow-up.
  - Semi-local Z-Scores: Semi-local Z-Scores are calculated using the global average, but with a moving average for the standard deviation in ROI 9 for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) having a semi-local  $Z > 3$  is marked for follow-up.
- **Z-Score Time Series Review:** The three types of Z-Scores for ROIs 6, 7, 9, and 10 for VDs 1, 3, and 4 are plotted in a time series and reviewed for additional peaks in Z-Scores.

Any location selected for follow-up or with a Z-Score  $> 3$  in a radium-, cesium-, or cobalt-specific ROI will undergo spectral analysis to determine if it is statistically likely that there are ROC concentrations present at that location in quantities greater than background.

A background spectrum is subtracted from the local spectral data for a given location, and the resulting net spectrum is plotted. Critical levels, as defined in Section 6.7.1 of the Multi Agency Radiation Survey and Site Investigation Manual are calculated and plotted based on background levels. The critical level is the level, in counts, at which there is a statistical probability (with a predetermined confidence) of incorrectly identifying a measurement system background value as greater than background. Any response above this level is considered to be greater than background. The critical level is calculated for ROIs 6, 7, 8, and 9 according to the equation shown below:

Where:

$$L_C = 2.33\sqrt{B}$$

LC	=	critical level (counts)
B	=	average background in the ROI

When count rates in the net gamma spectrum at a given location do not exceed critical levels for any radium-, cesium-, or cobalt-specific energy ranges, it is unlikely that ROC concentrations exist at that location above background.

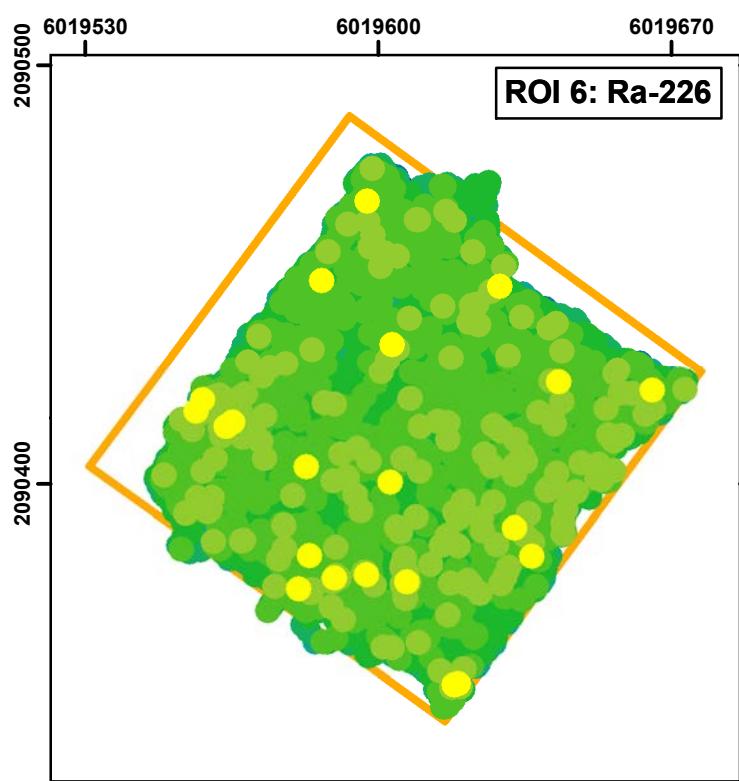
Any data point that is both above the critical level and within the energy range of a given ROI is considered above background for that radionuclide and will be flagged for further investigation in the field.

**RSI Data Plots**  
**HPNS Parcel E-2**  
**RSY Pad B6 (Use 8)**

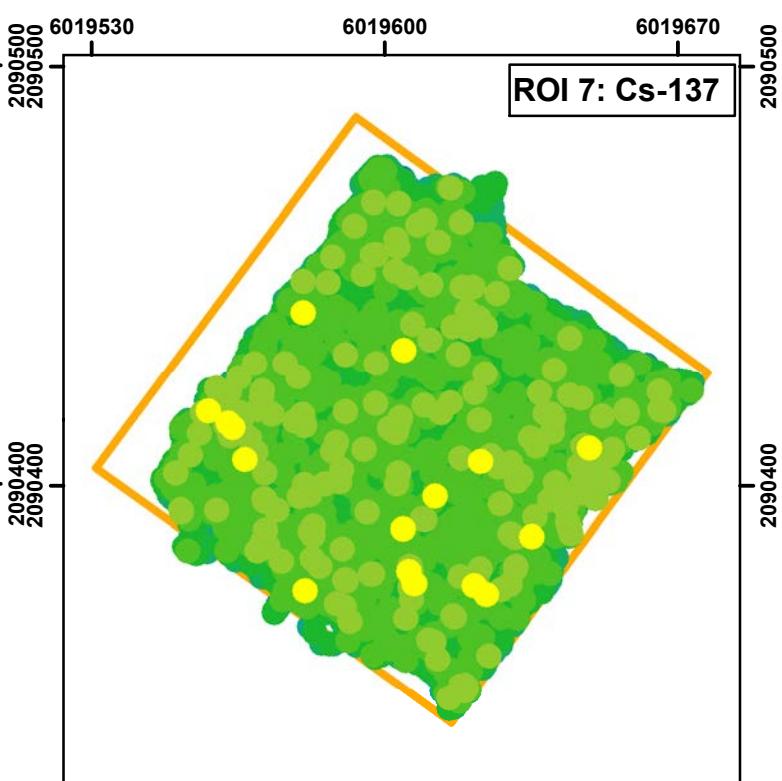
Page 5 of 60

Soil Excavation Site:  
Revetment Spoils

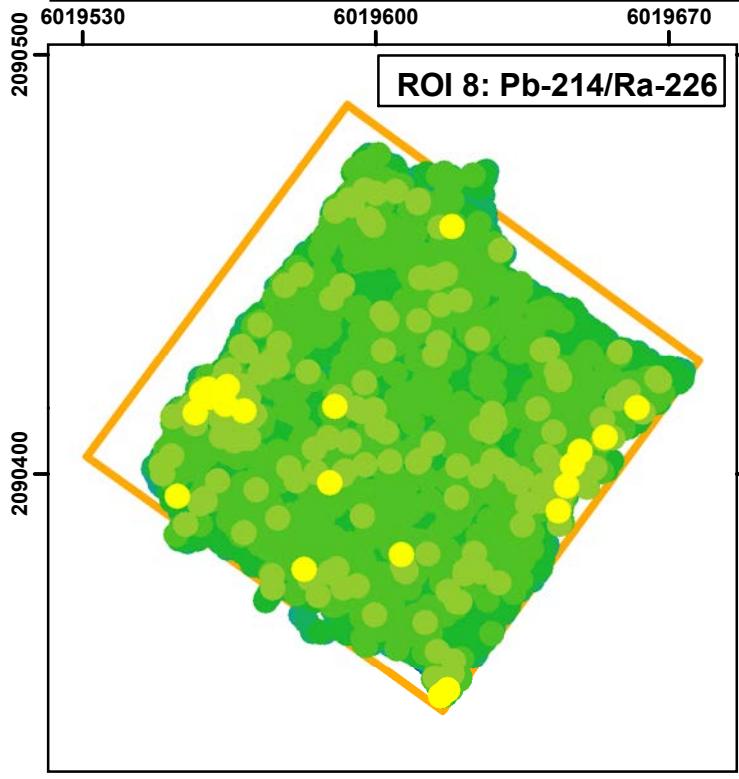
Contour Map



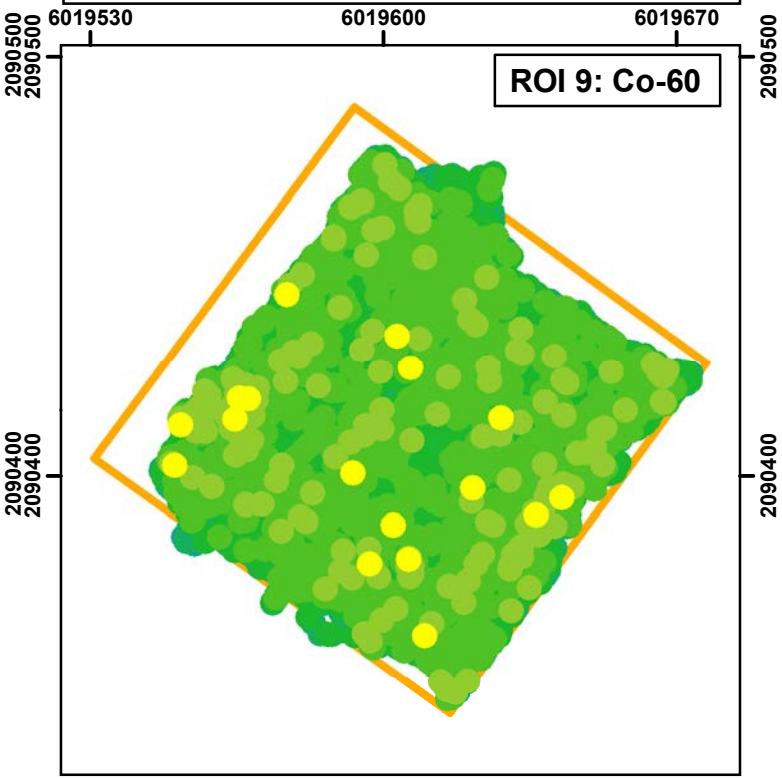
**ROI 6: Ra-226**



**ROI 7: Cs-137**



**ROI 8: Pb-214/Ra-226**



**ROI 9: Co-60**

**RS 700 Gamma Walkover Survey Data (VD1)**

- |   |  |
|---|--|
| Yellow circle: > 3 std dev              | Green circle: > -1 to < 0 std dev      |
| Light green circle: > 2 to < 3 std dev  | Cyan circle: > -2 to < -1 std dev      |
| Medium green circle: > 1 to < 2 std dev | Dark blue circle: > -3 to < -2 std dev |
| Dark green circle: > 0 to < 1 std dev   | Blue circle: < -3 std dev              |
- RSY Pad Boundaries

0 20 40 80  
Feet

Coordinate system: CSP Zone III, NAD83, US Survey Foot

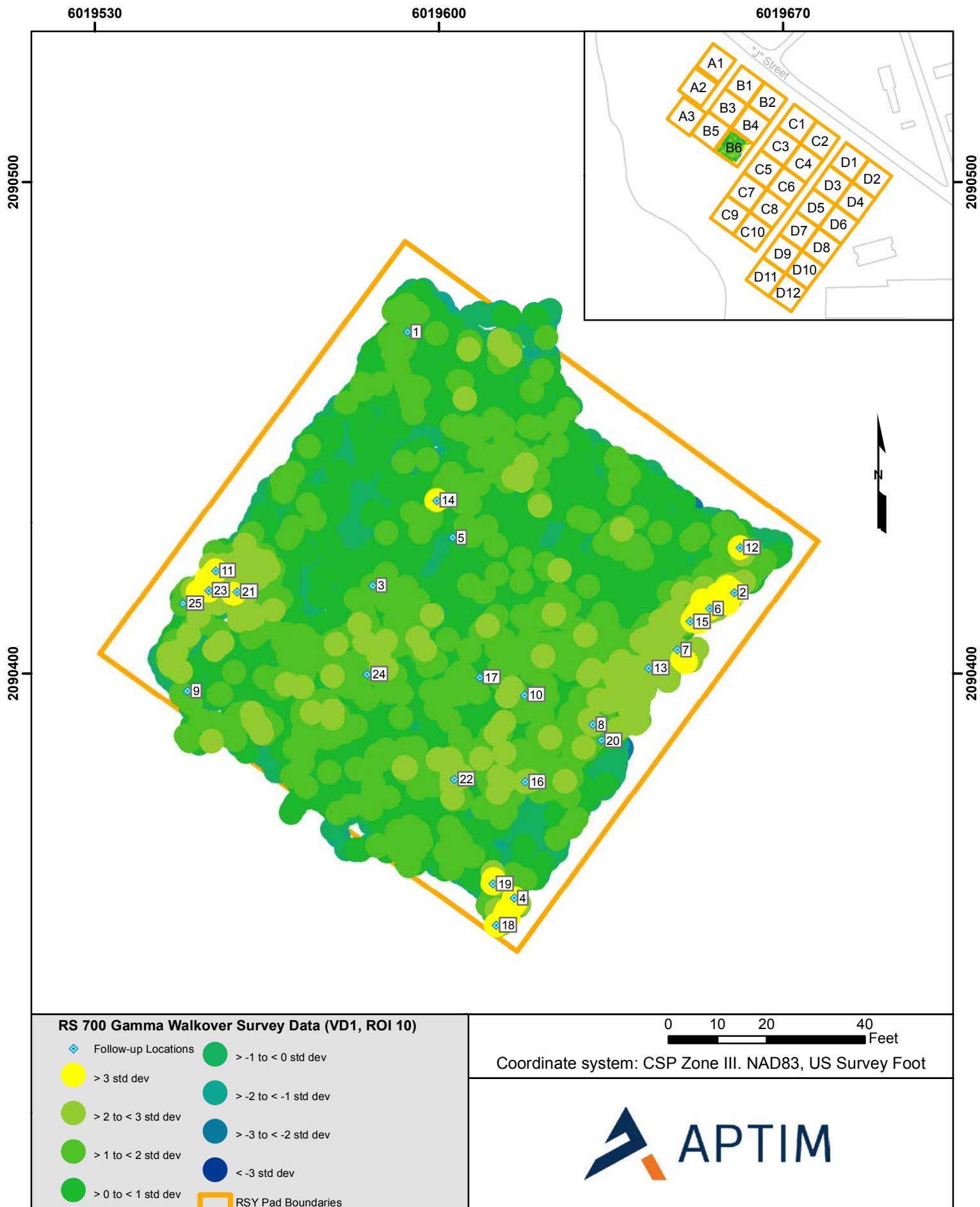


## RSI Review Summary

### **Summary:**

25 locations were initially selected for follow-up investigation. Locations were identified by elevated peaks noted in the playback review and/or time series charts, and by using the Z-Score, Local Z-Score, and Semi-Local Z-Score reviews as described in the RSI Data Evaluation Process on pages 3-4. Spectral analyses performed on gamma static data at these locations do not indicate the presence of  $^{226}\text{Ra}$ ,  $^{137}\text{Cs}$ , or  $^{60}\text{Co}$  above background. Gamma static readings at these locations are less than the Reference Area static IL for ROIs 3, 6, 7, 8, and 9; figures are provided on pages 9-33.

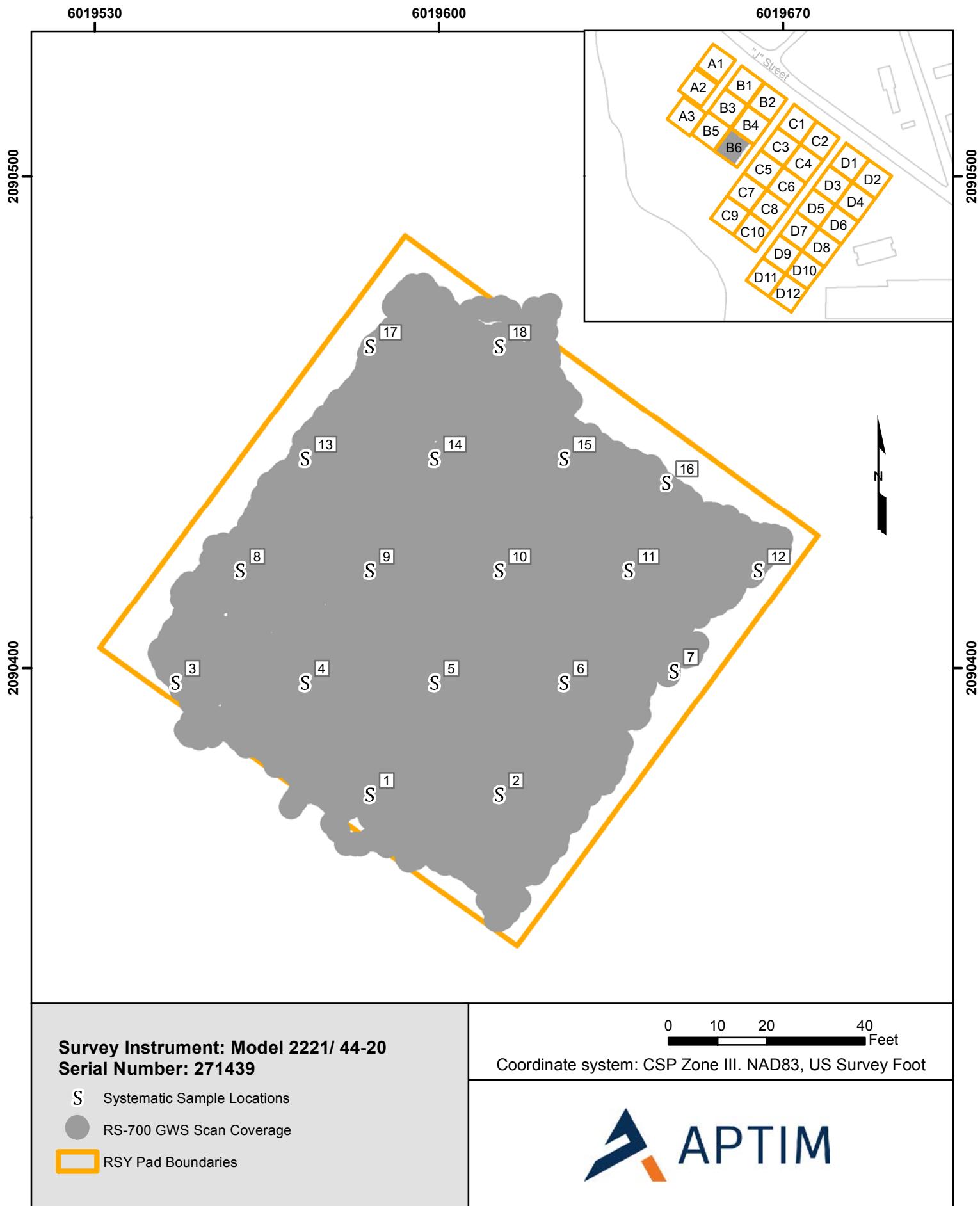
# HPNS Parcel E-2 RSY Pad B6 (Use 7)

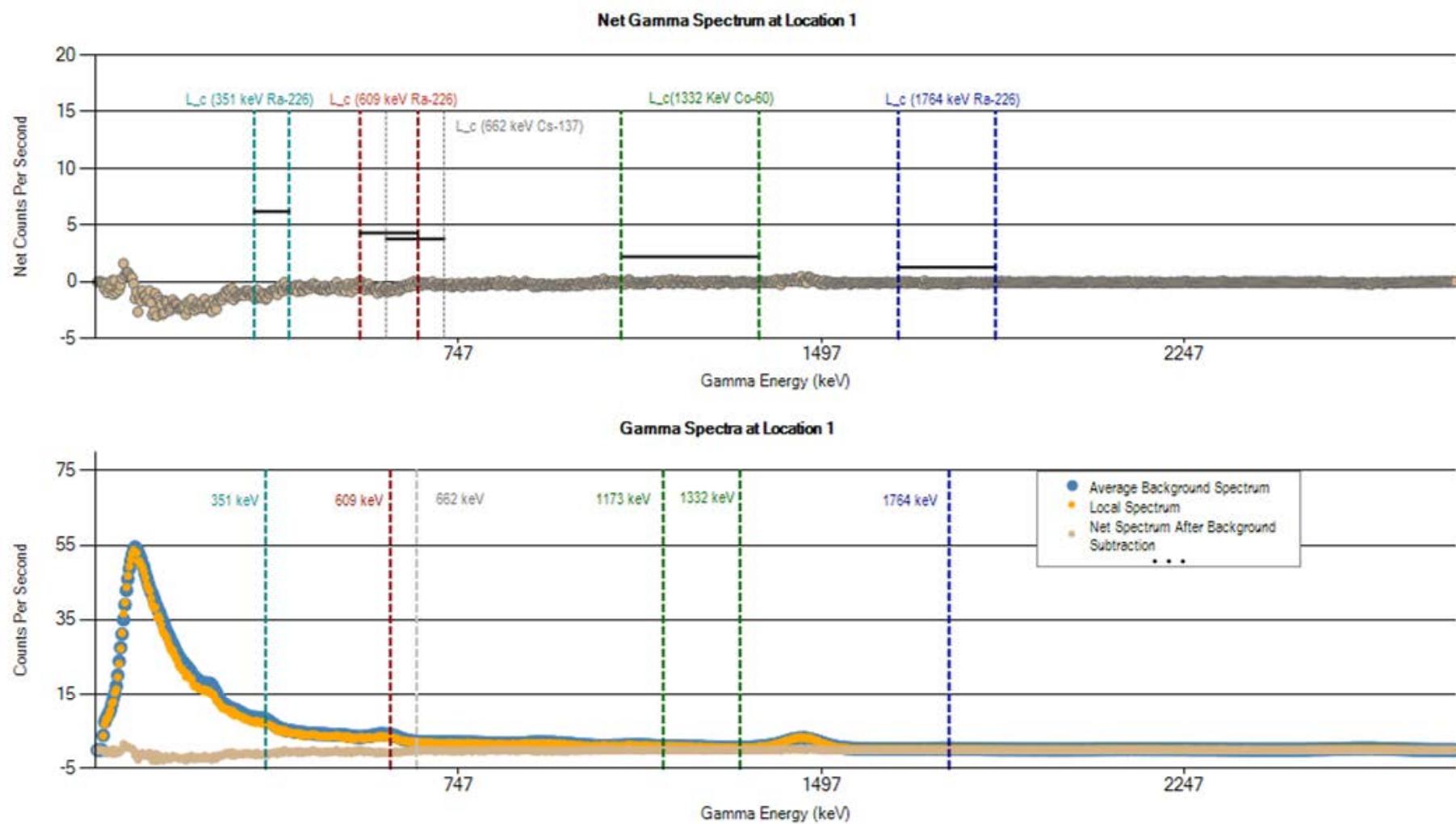


Systematic Sample Survey  
HPRS-07022018-PE2-JSS-2695

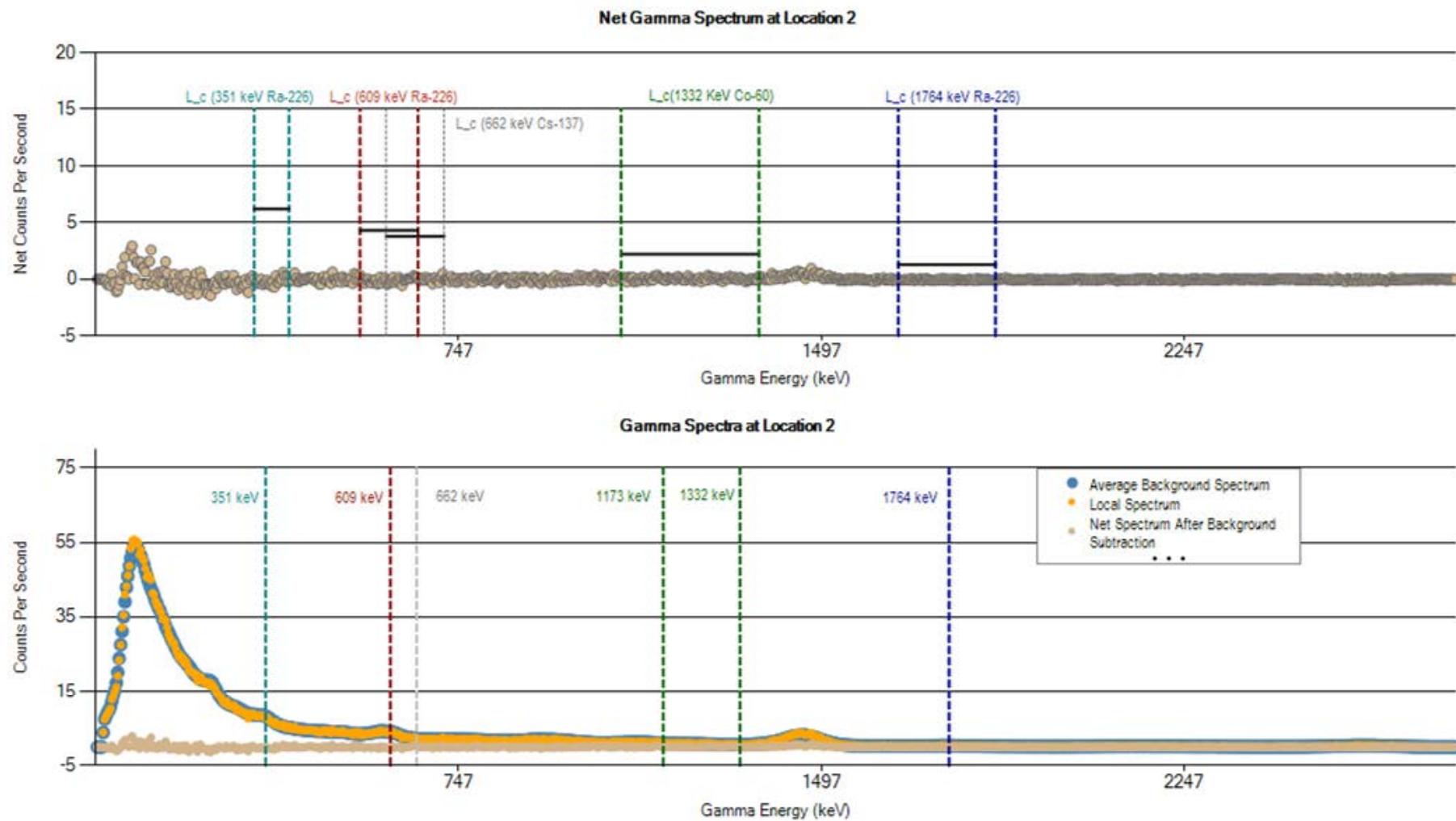
## HPNS Parcel E-2 RSY Pad B6 (Use 8)

Soil Excavation Site:  
Revetment Spoils

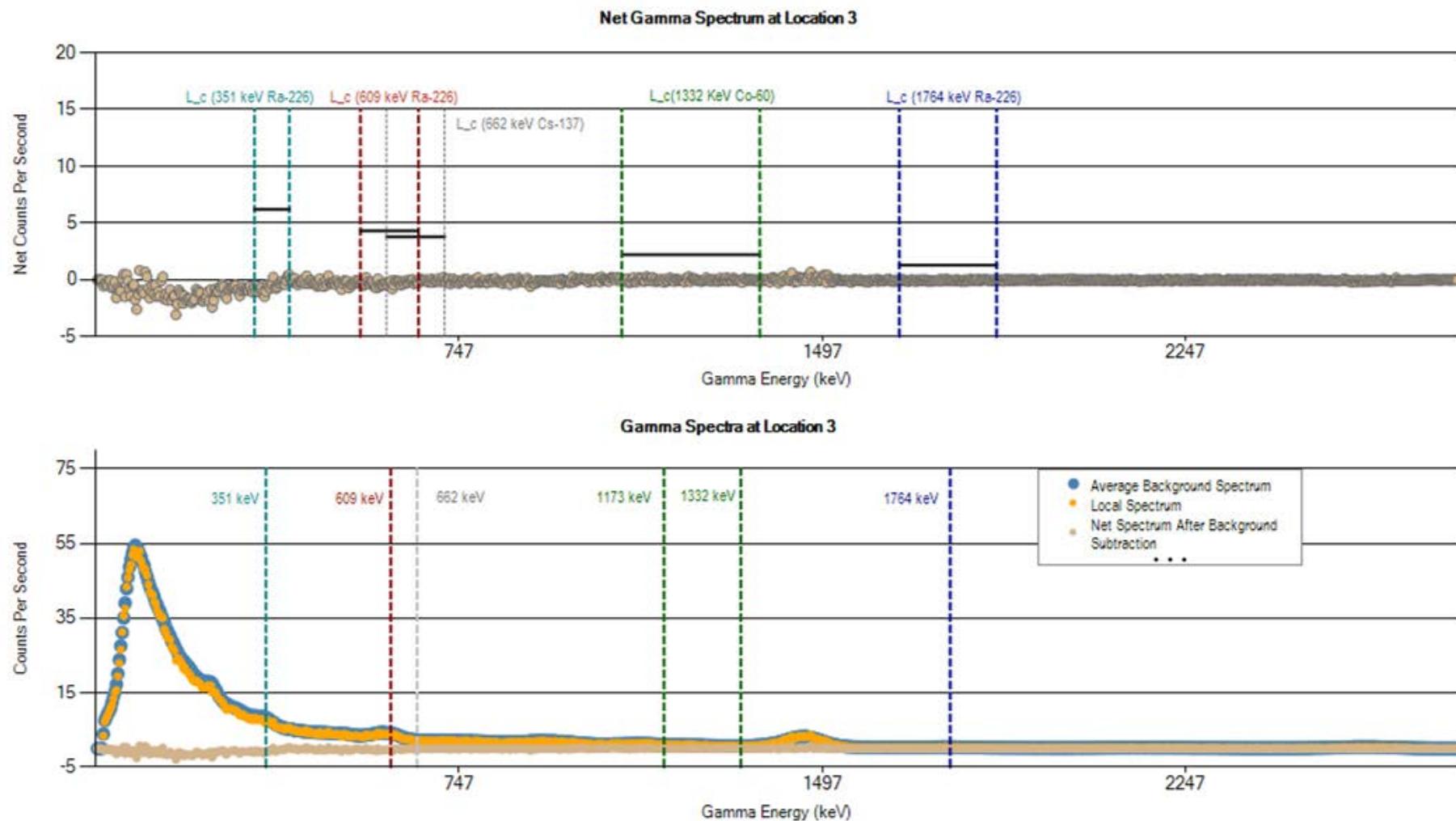




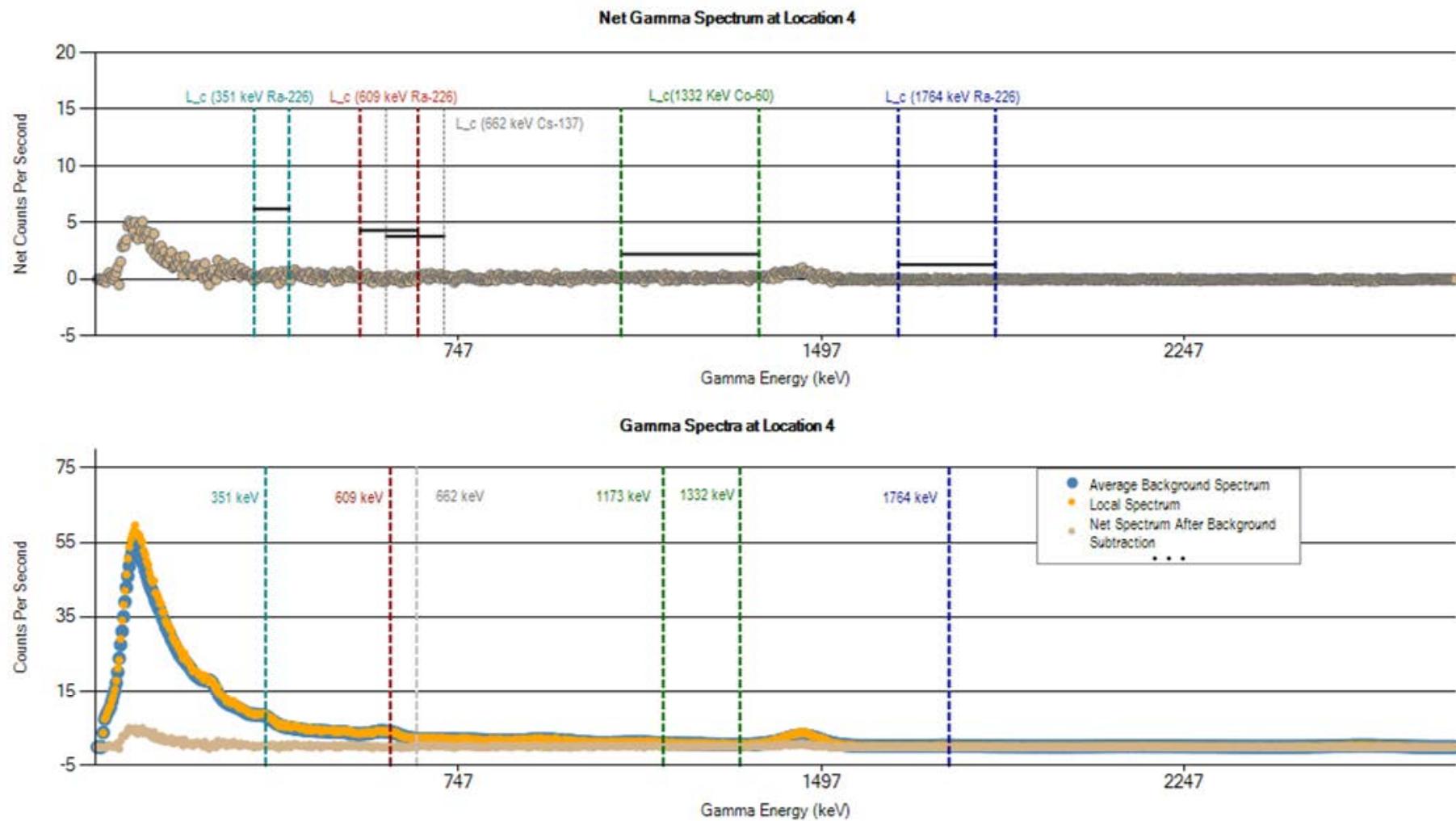
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 1 (cps)	764	117	15	18	133	120	94	152	85	3354
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



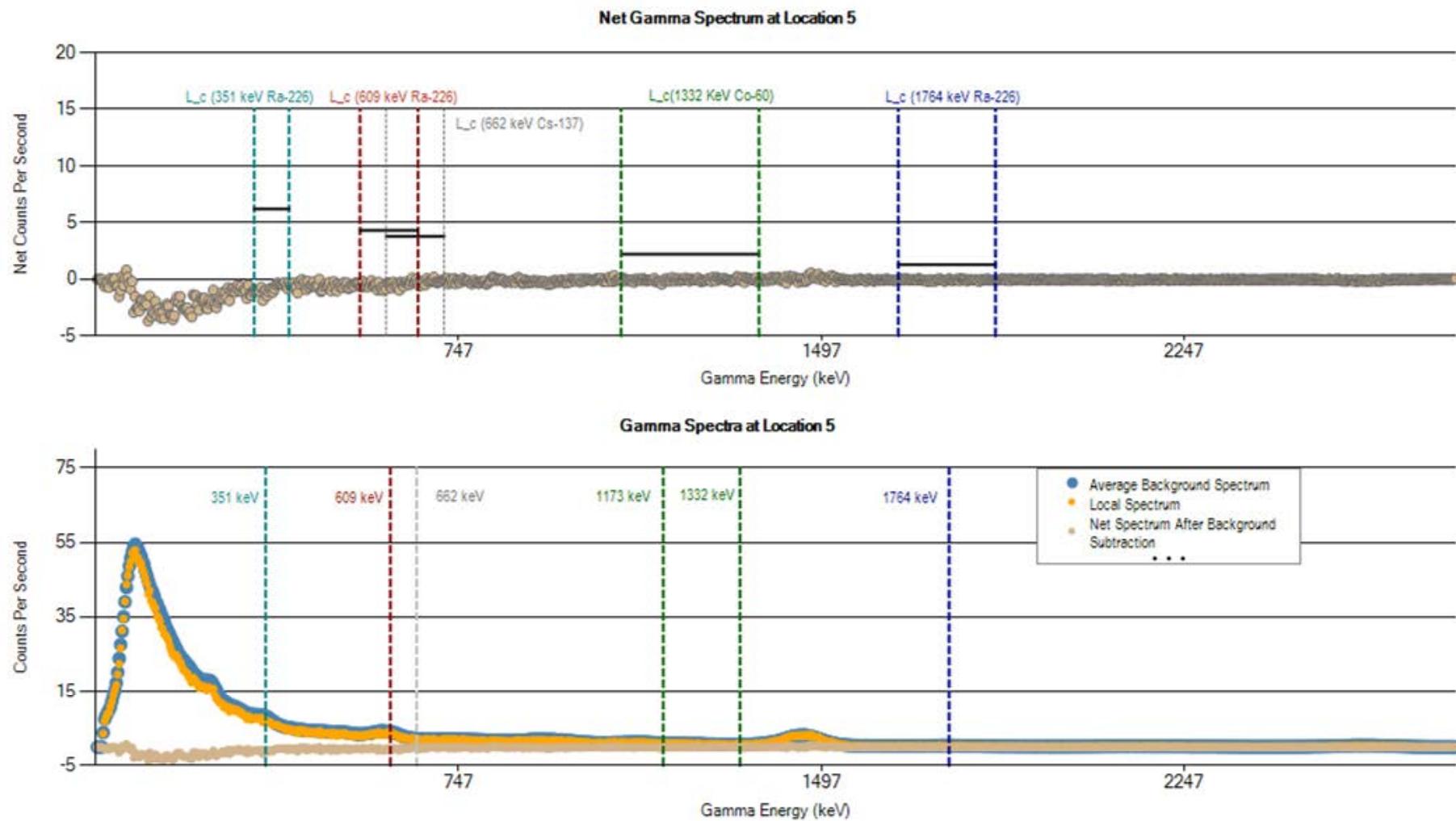
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 2 (cps)	861	129	18	21	150	137	107	170	93	3616
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



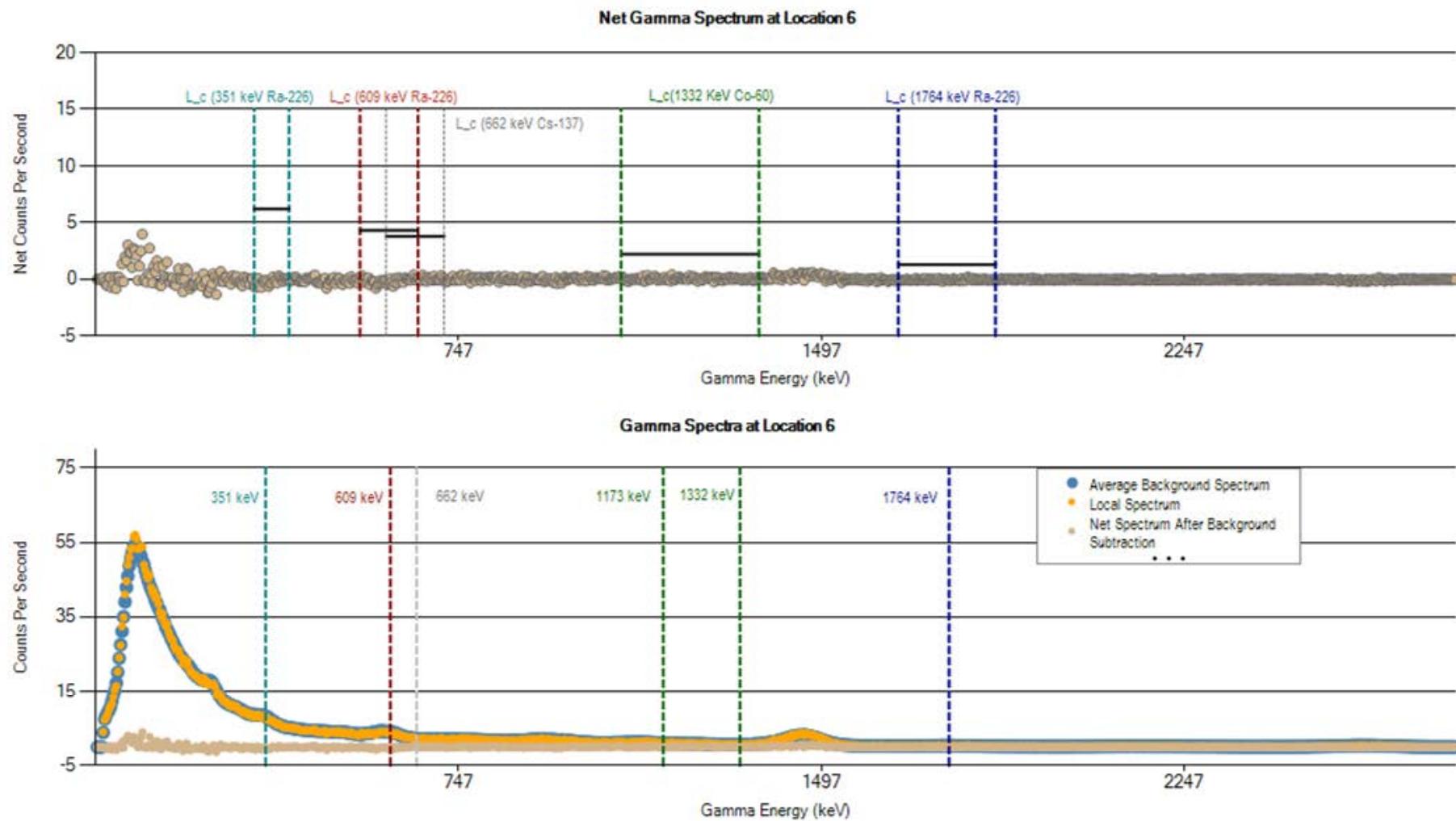
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 3 (cps)	808	118	17	19	140	129	101	162	87	3446
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



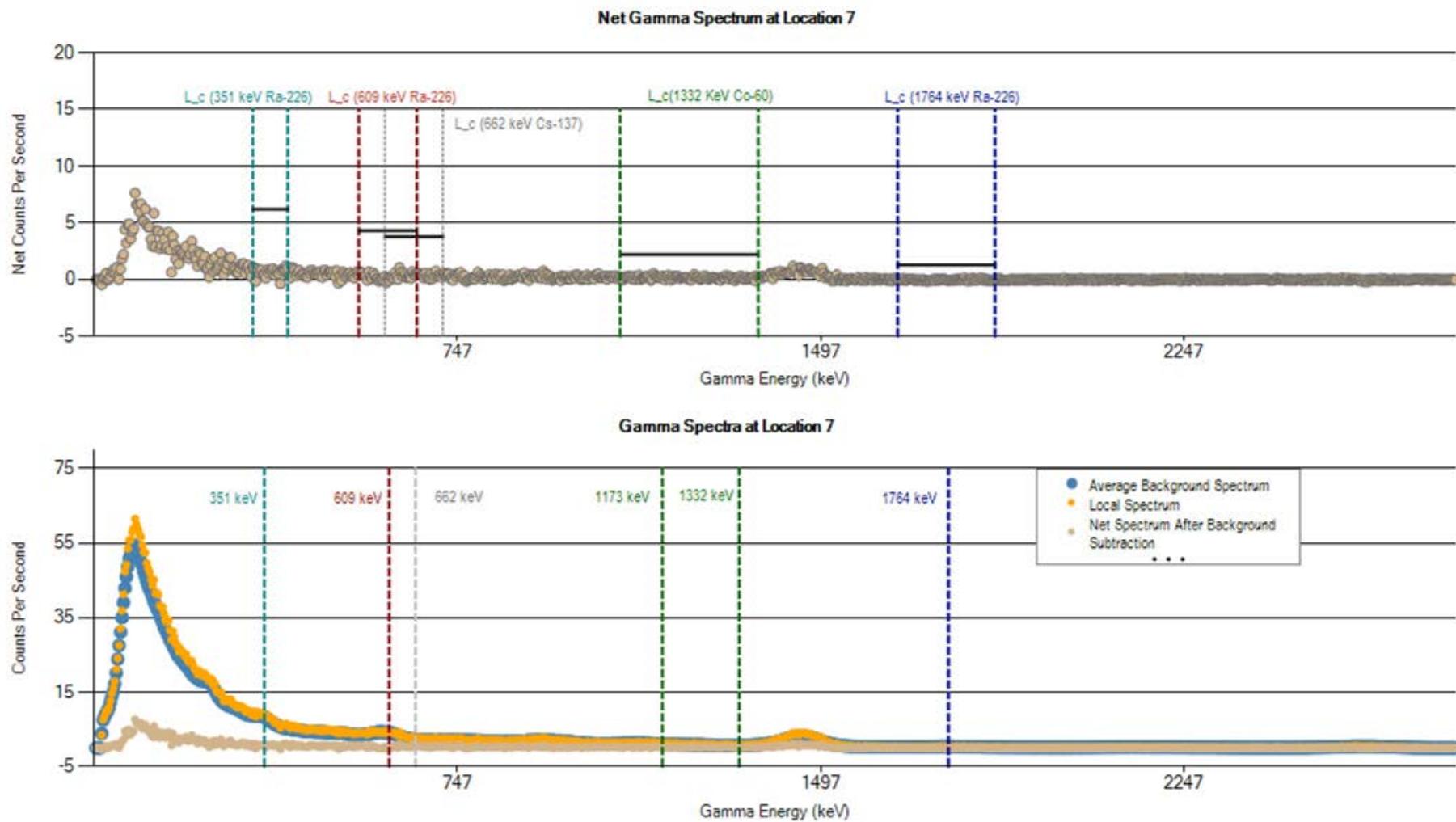
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 4 (cps)	914	134	18	21	161	143	113	181	101	3843
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



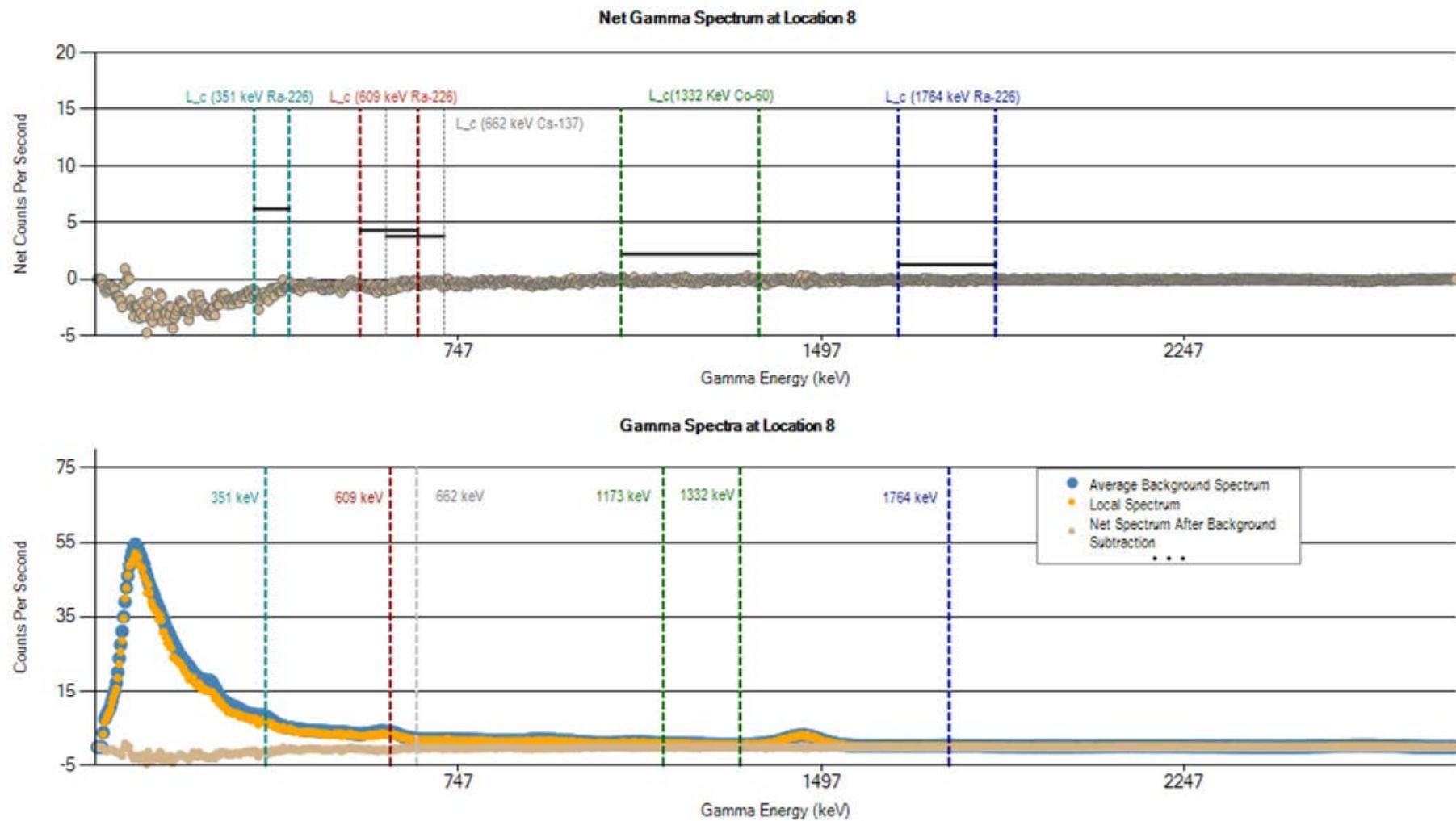
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 5 (cps)	772	118	17	18	131	121	96	154	84	3331
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



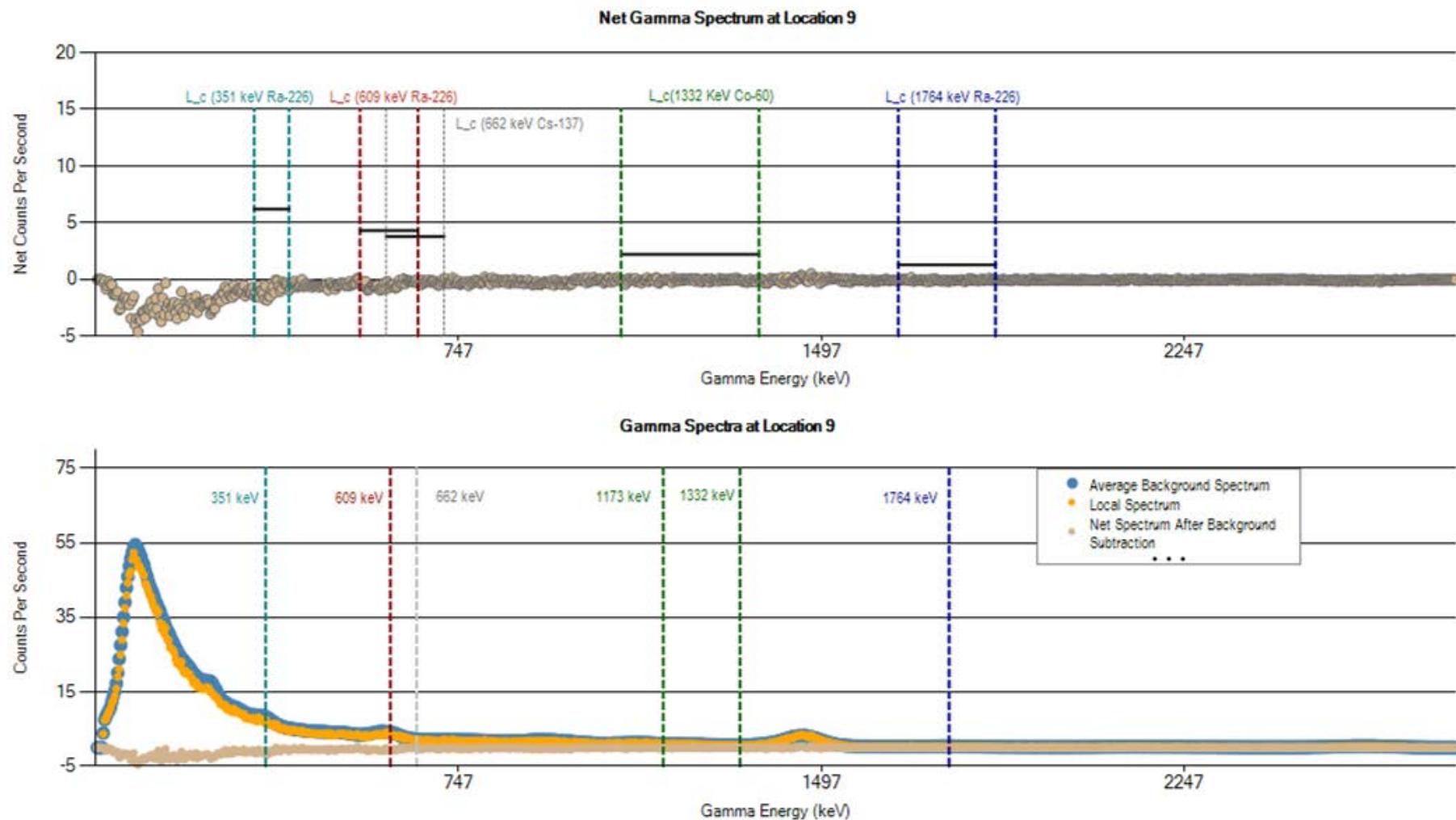
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 6 (cps)	854	128	18	20	146	135	106	170	92	3634
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



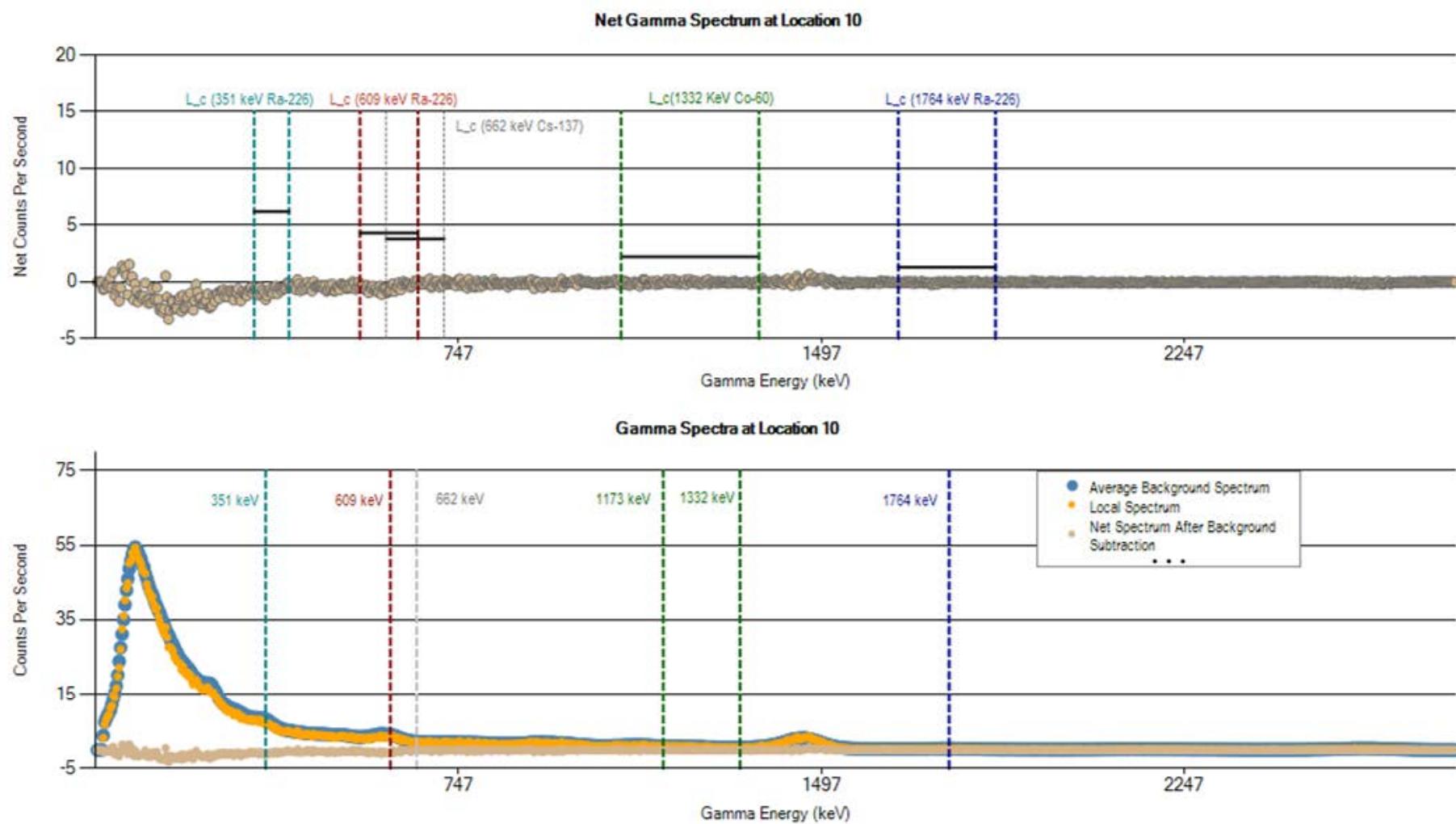
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 7 (cps)	969	144	20	23	169	153	121	191	105	3986
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



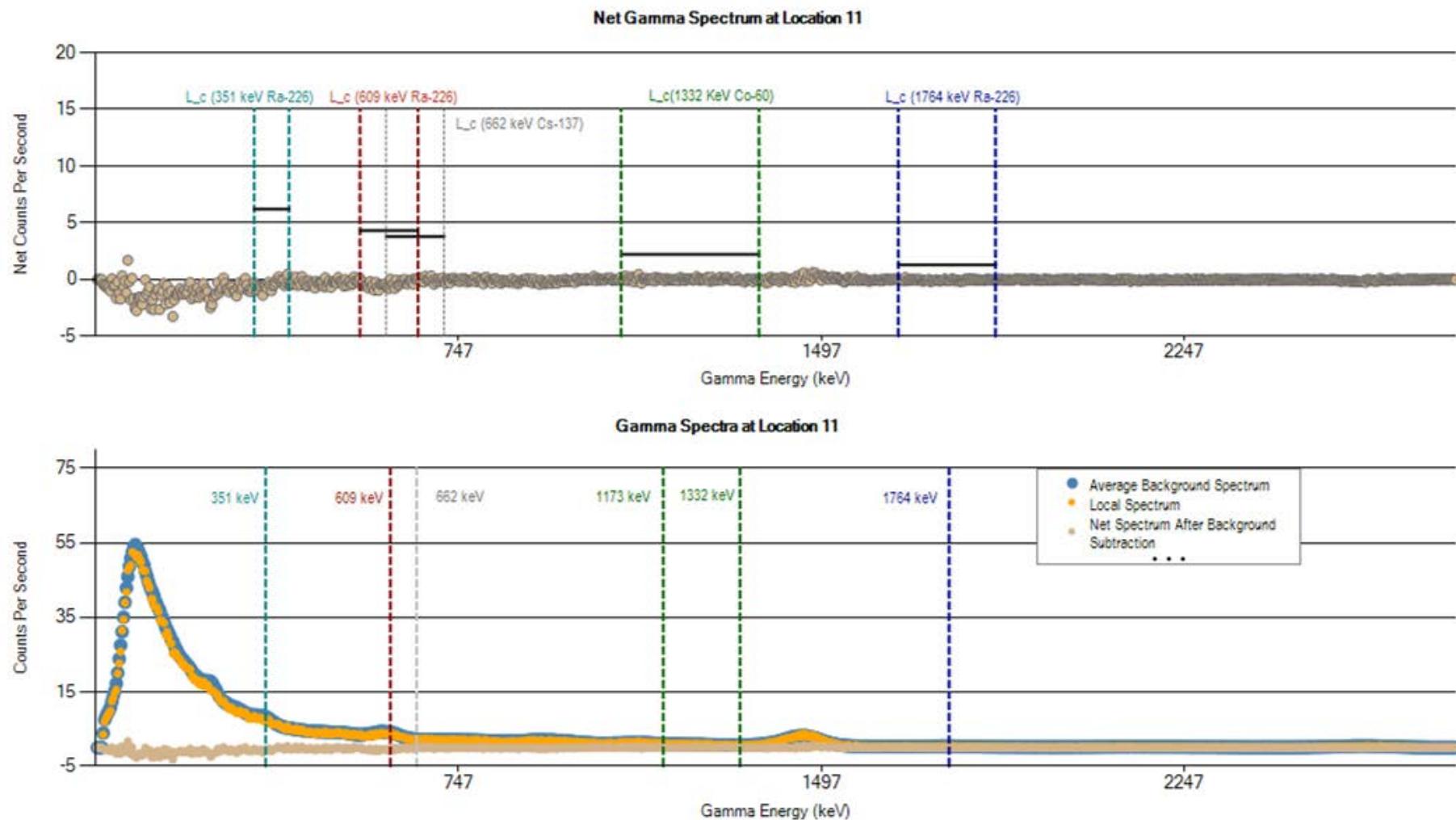
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 8 (cps)	730	109	15	17	128	116	91	147	79	3241
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



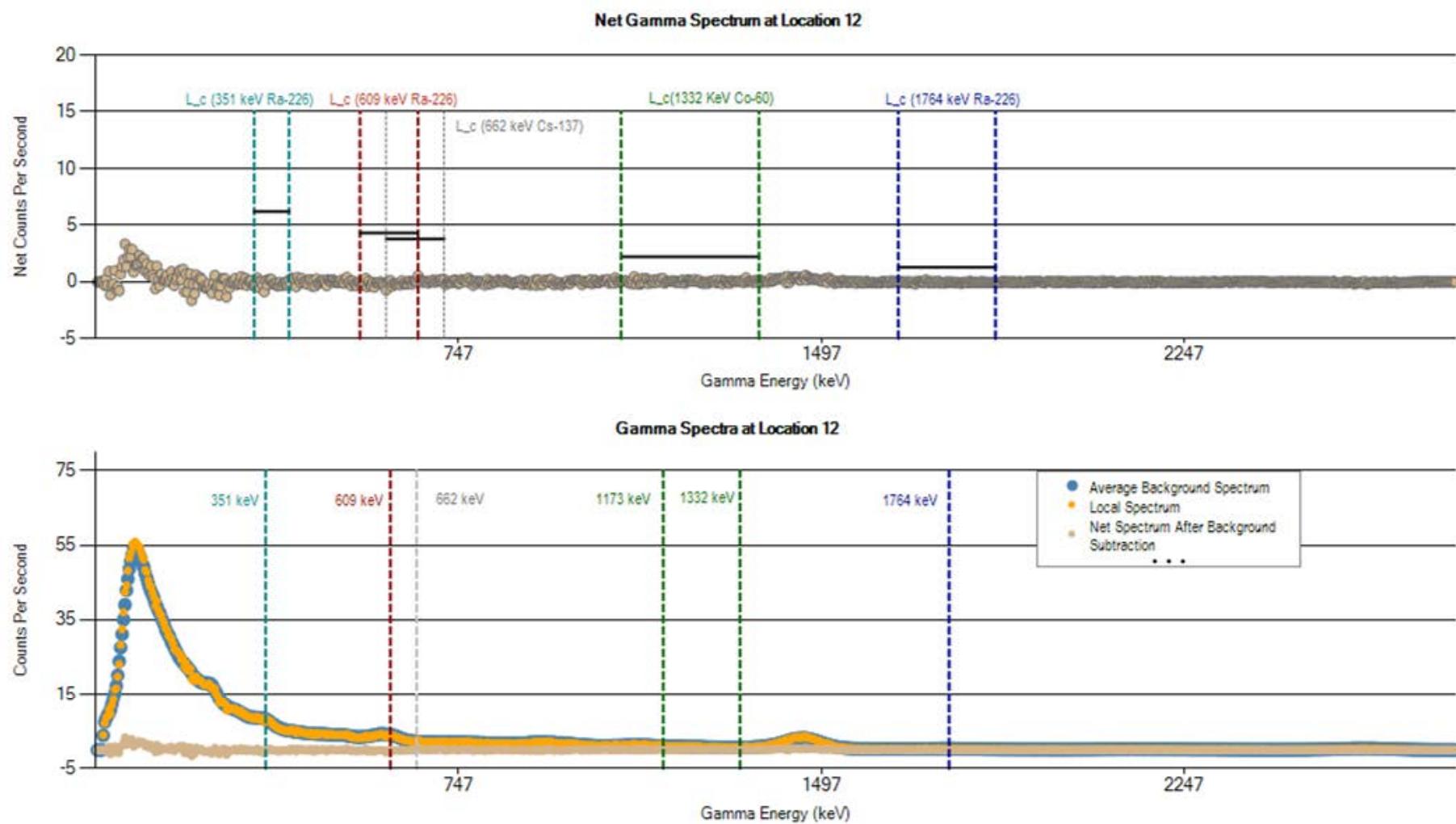
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 9 (cps)	762	114	16	17	133	122	96	152	82	3292
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



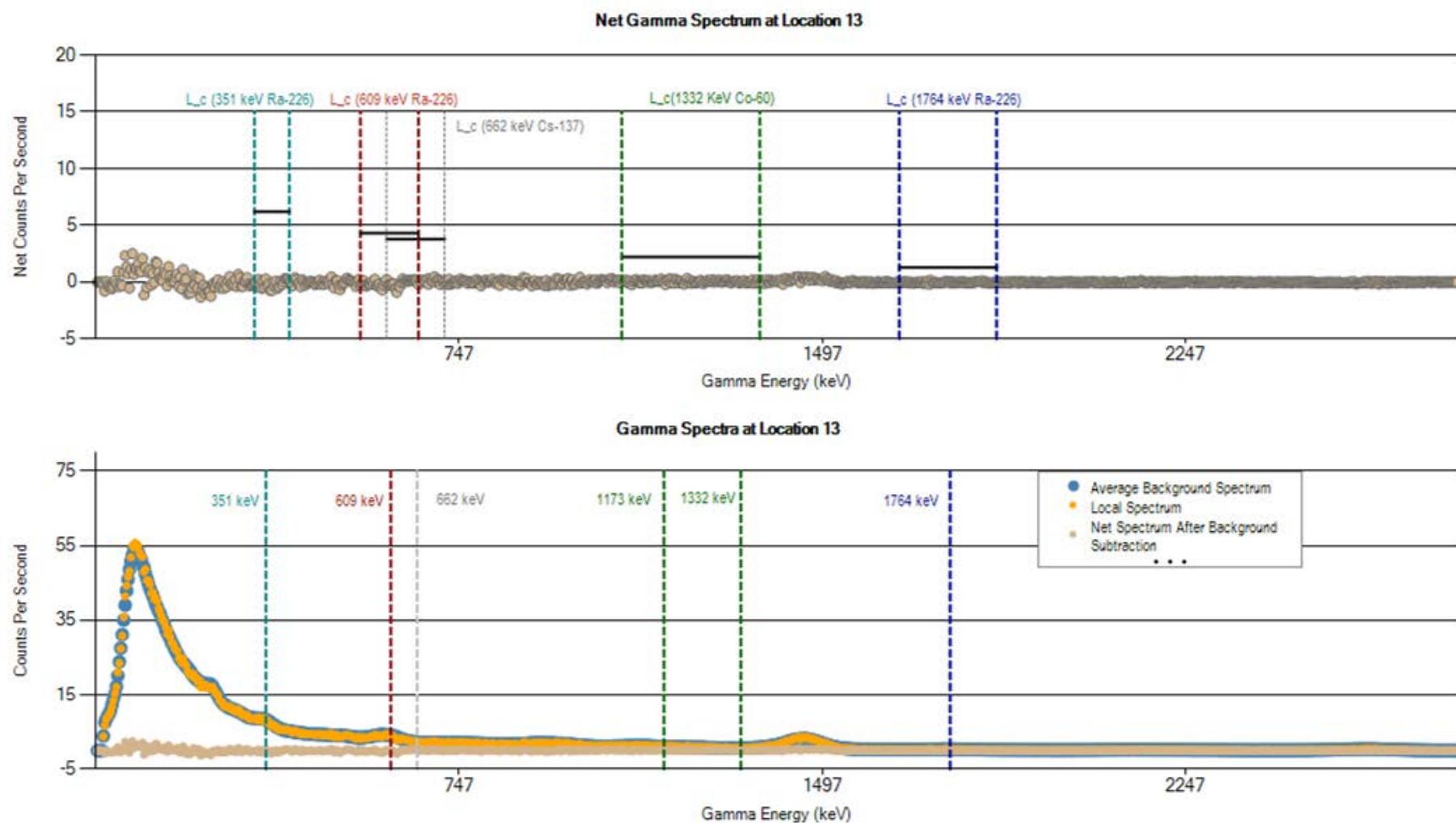
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 10 (cps)	783	118	17	18	134	122	98	156	84	3400
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



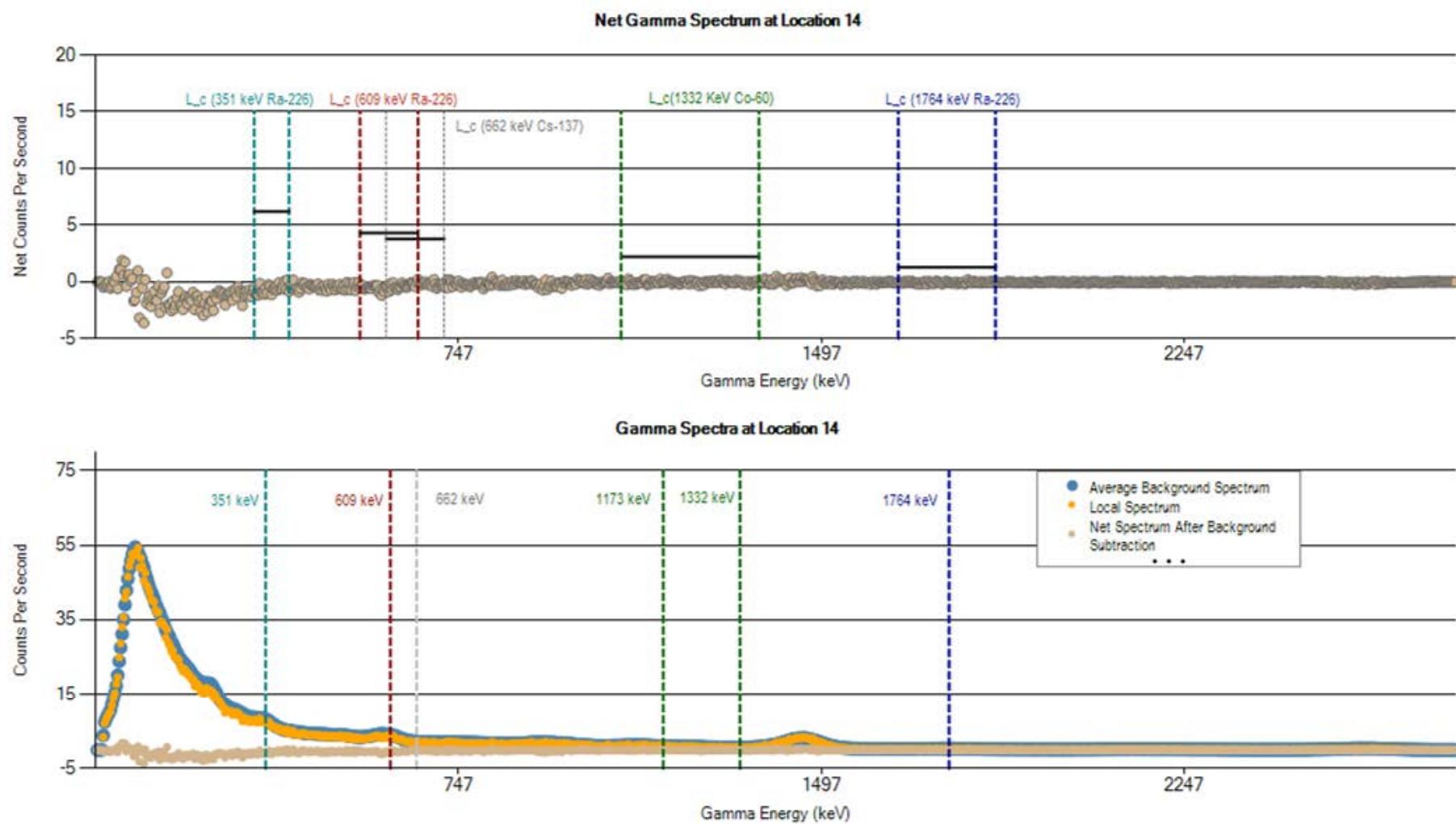
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 11 (cps)	807	120	17	19	140	125	100	163	90	3442
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



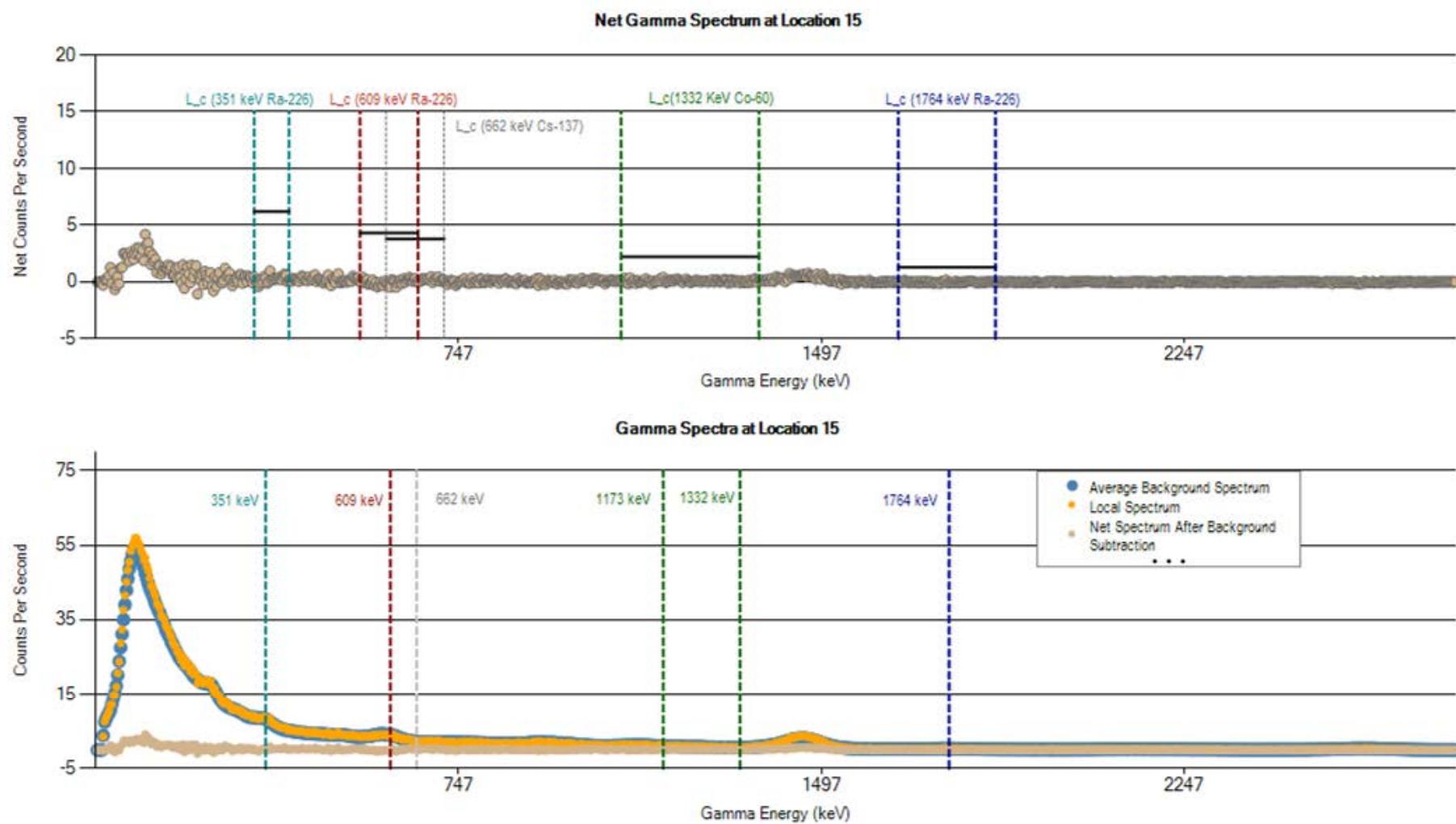
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 12 (cps)	857	126	18	20	150	136	107	171	93	3646
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



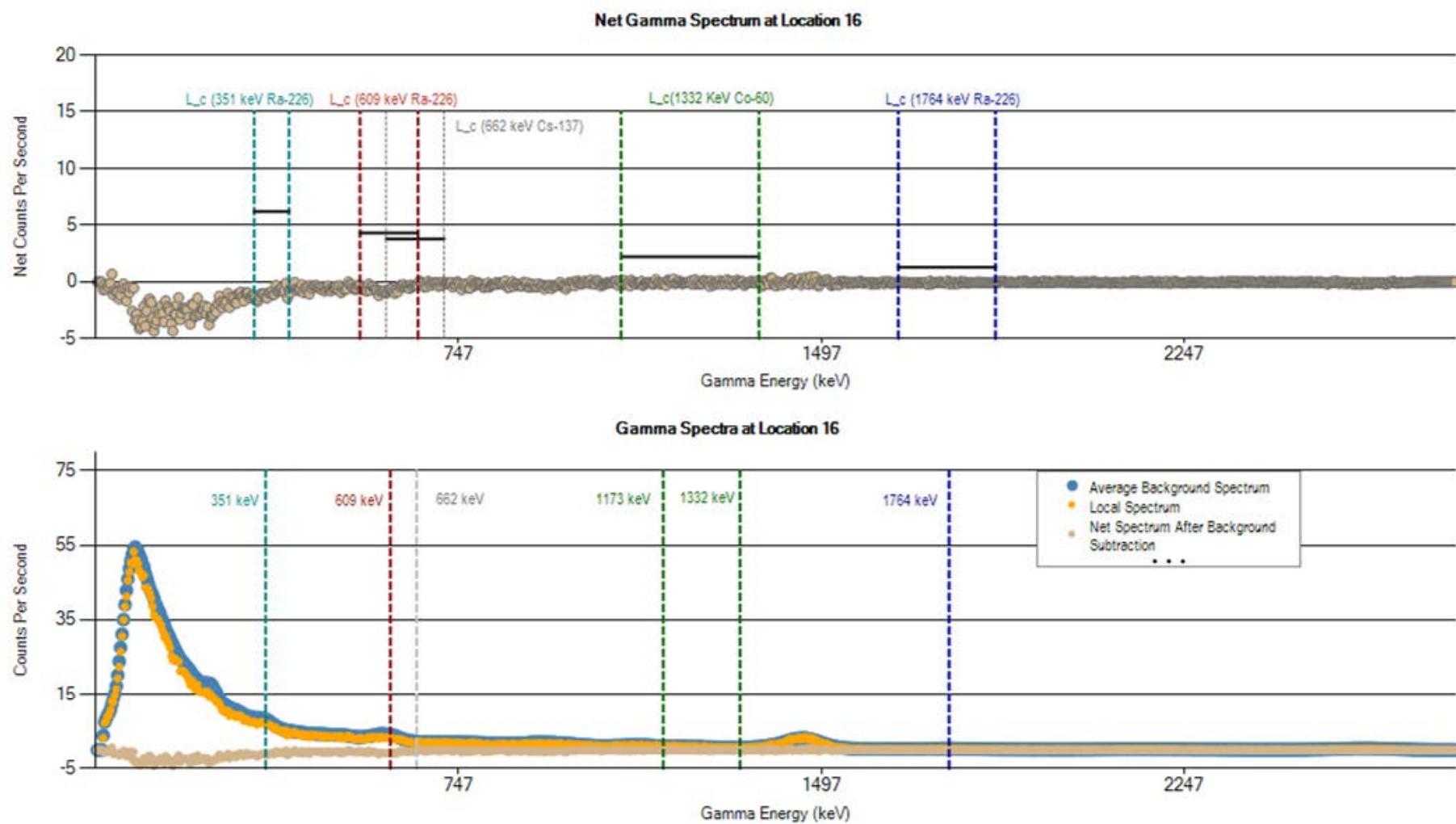
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 13 (cps)	859	125	19	21	149	135	107	171	94	3627
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



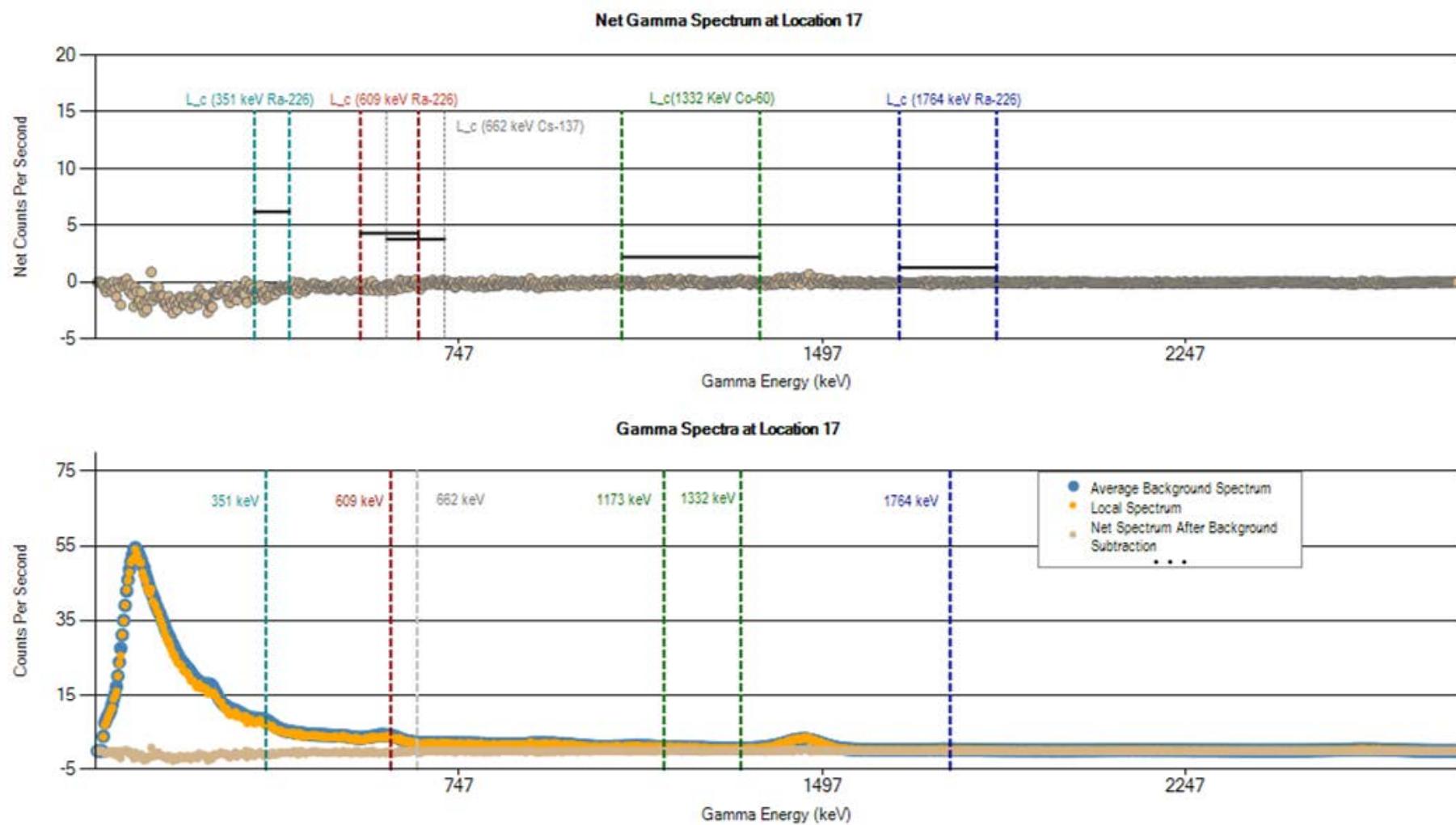
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 14 (cps)	779	116	17	19	133	123	96	159	85	3406
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



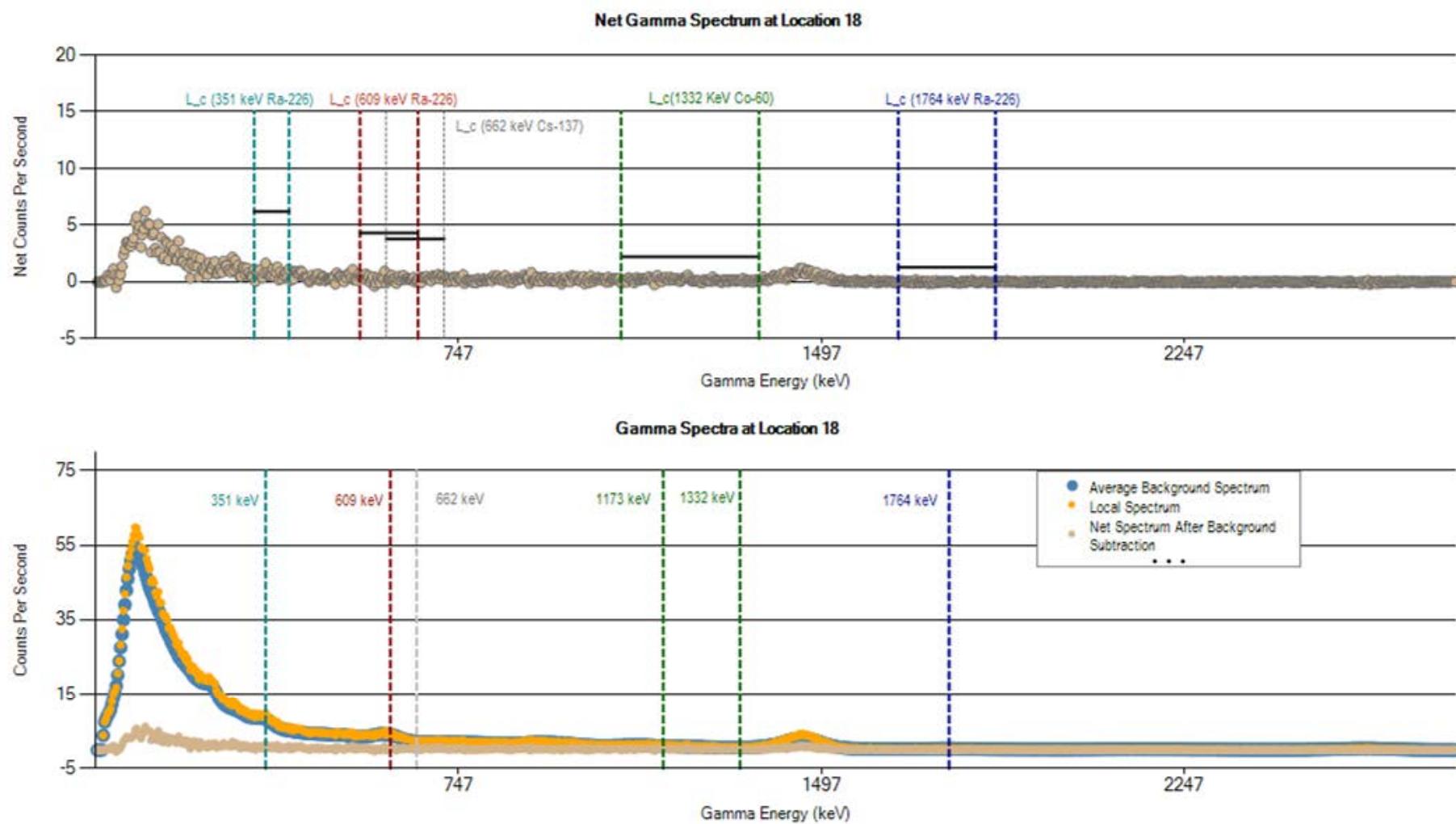
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 15 (cps)	892	133	19	21	156	140	112	180	96	3751
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



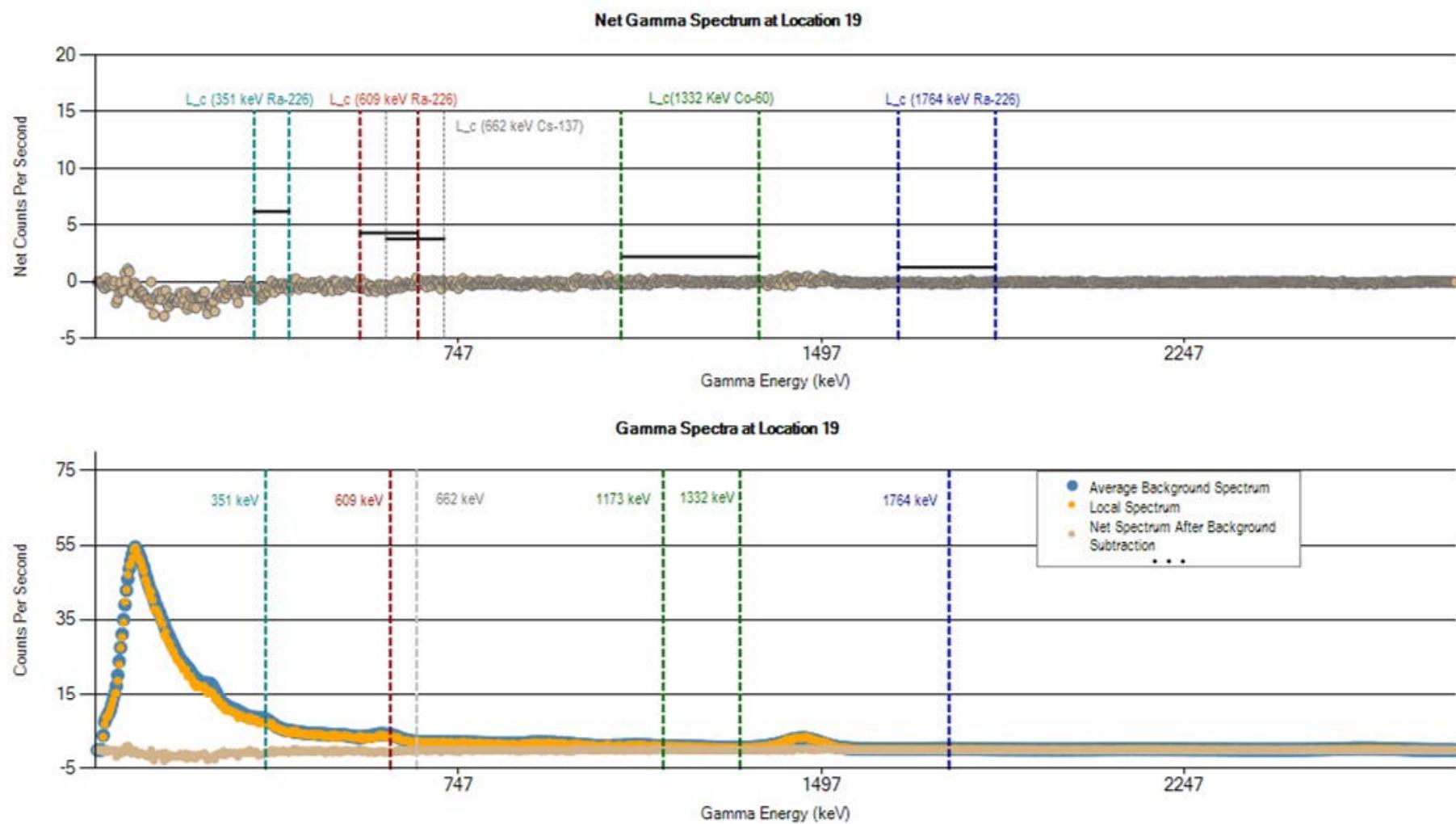
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 16 (cps)	748	113	16	17	131	116	93	149	81	3266
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



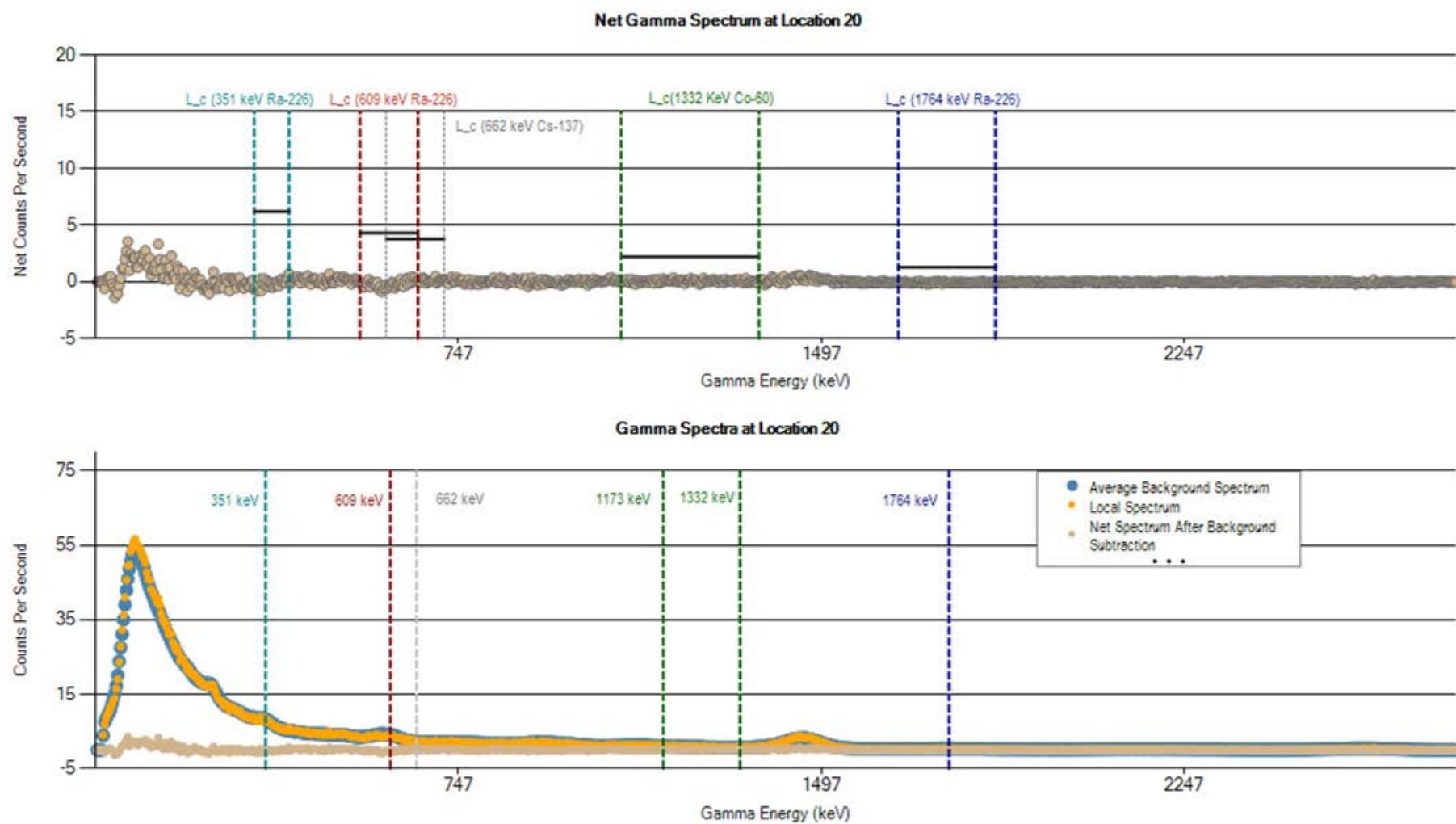
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 17 (cps)	793	118	18	19	136	126	100	156	87	3408
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



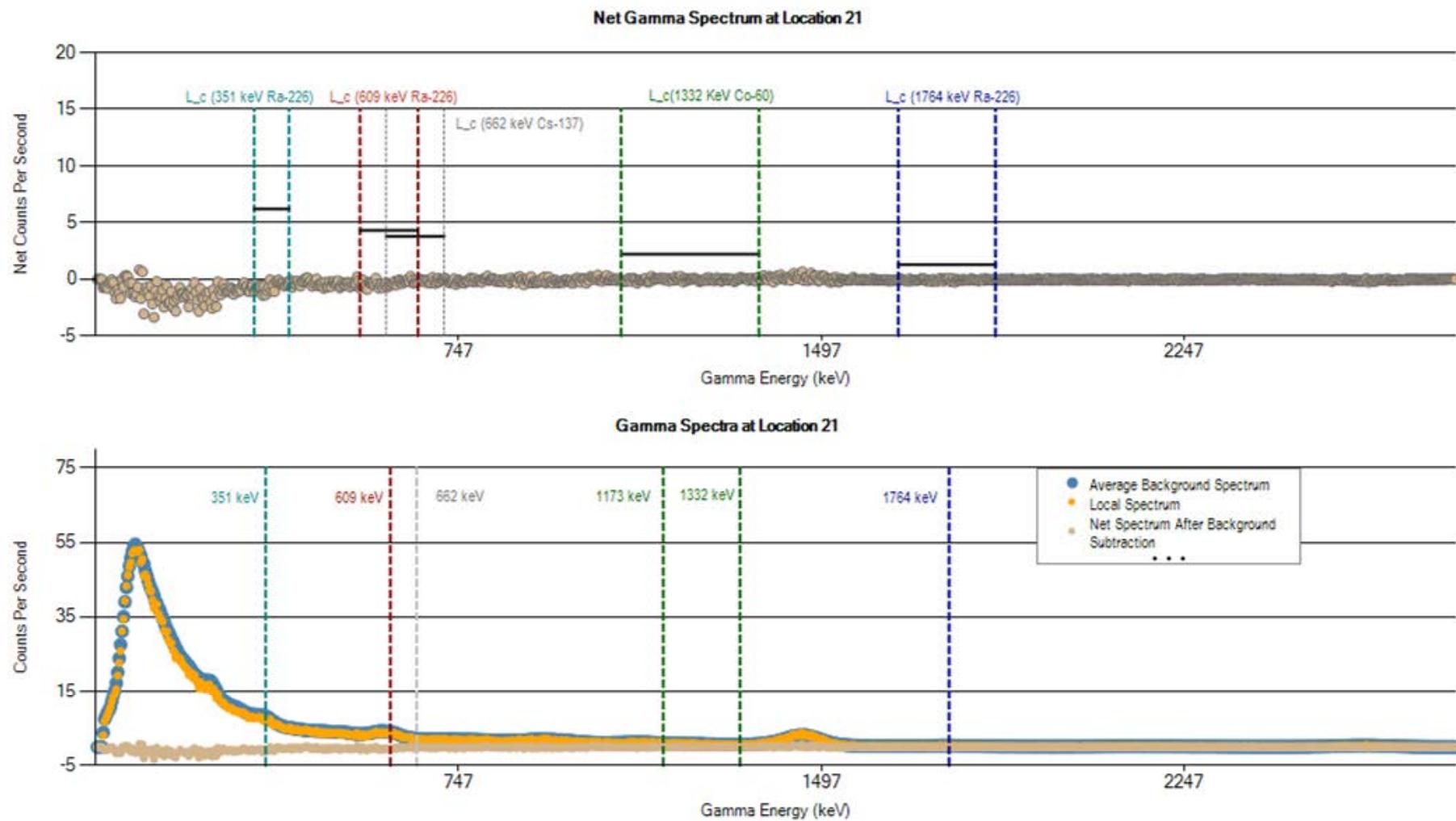
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 18 (cps)	960	143	20	23	167	151	120	191	105	3947
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



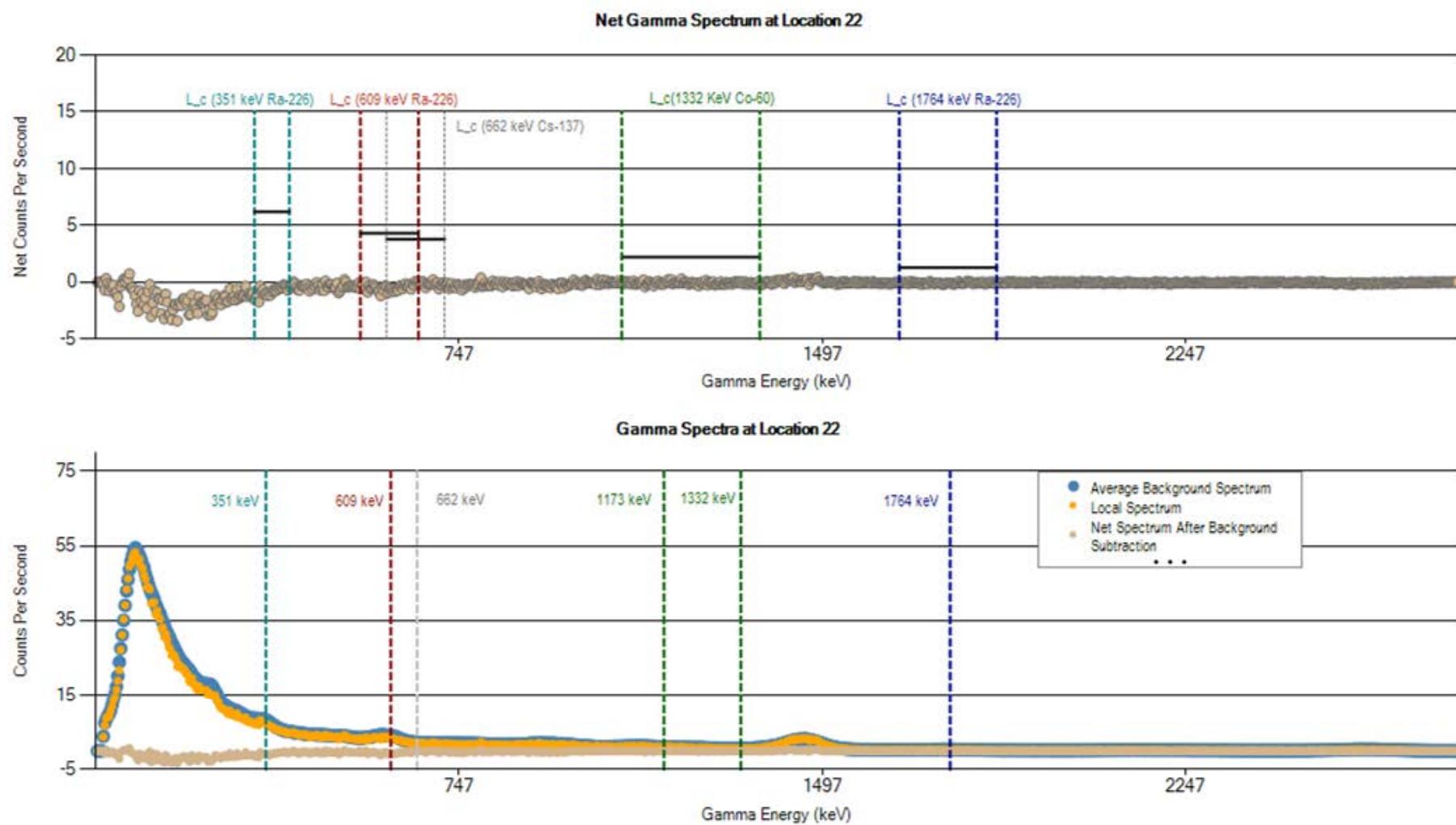
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 19 (cps)	797	121	16	19	139	124	98	158	88	3421
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



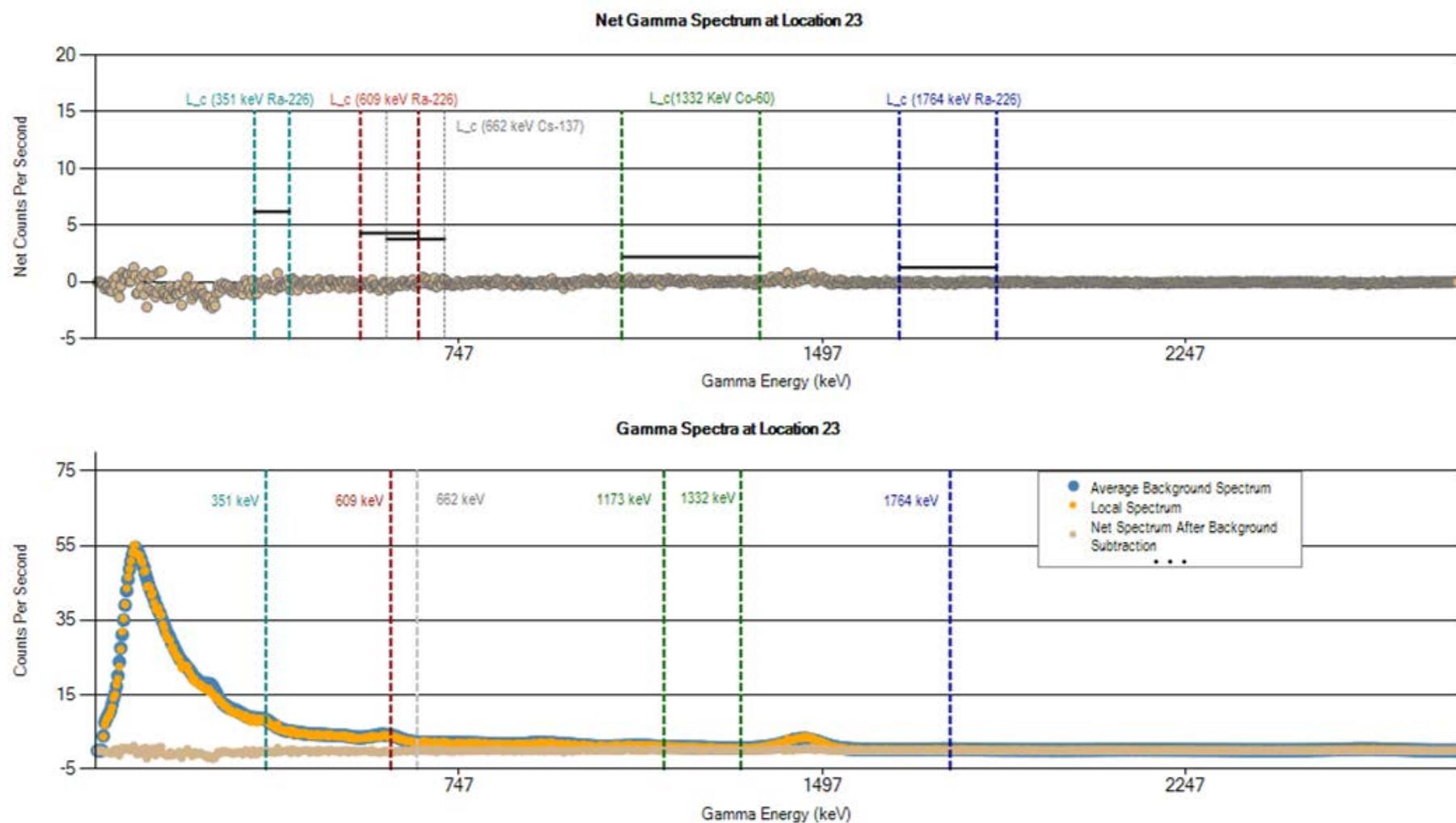
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 20 (cps)	868	126	17	22	154	134	108	171	95	3676
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



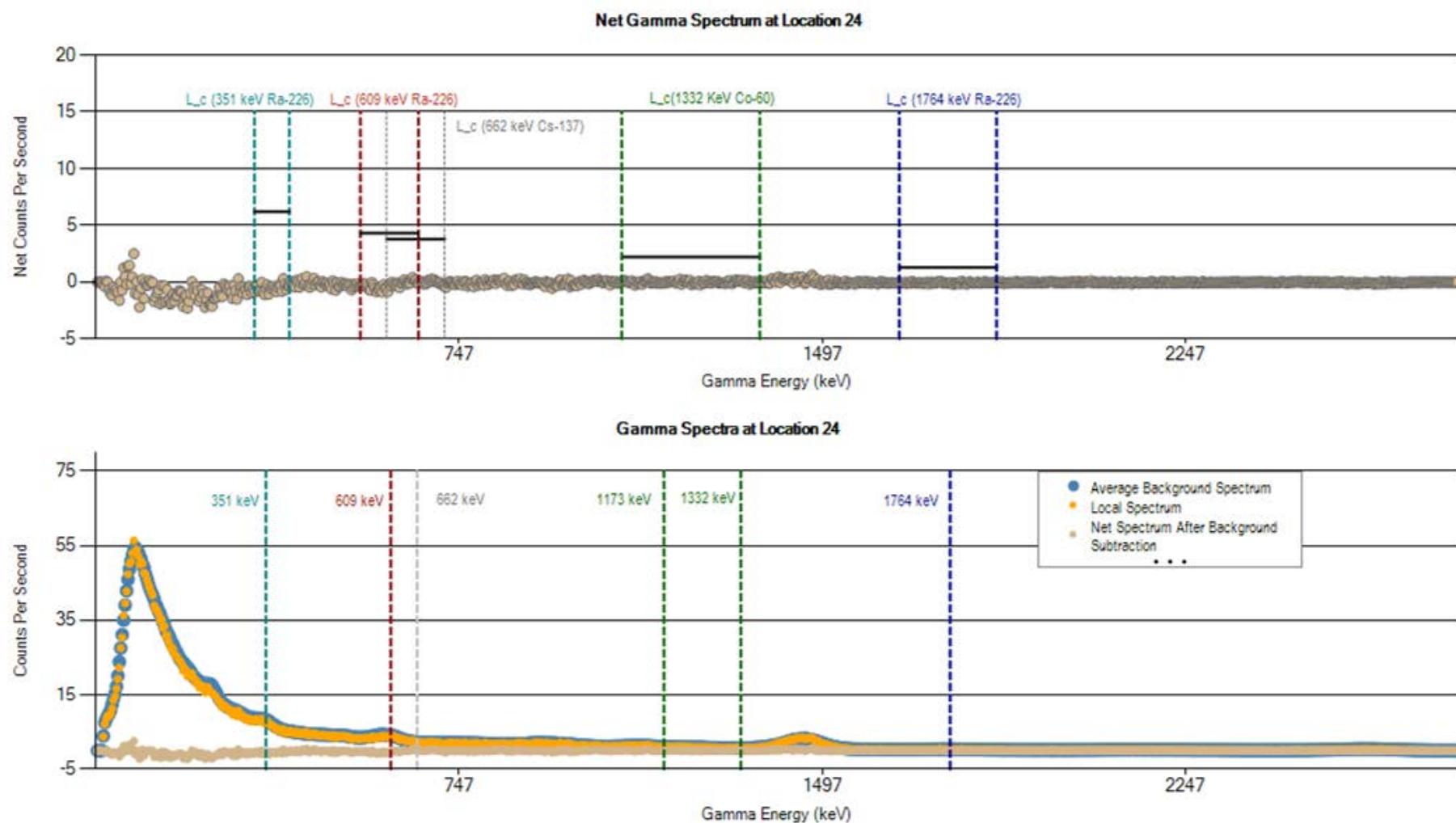
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 21 (cps)	799	120	17	18	135	127	100	160	87	3421
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



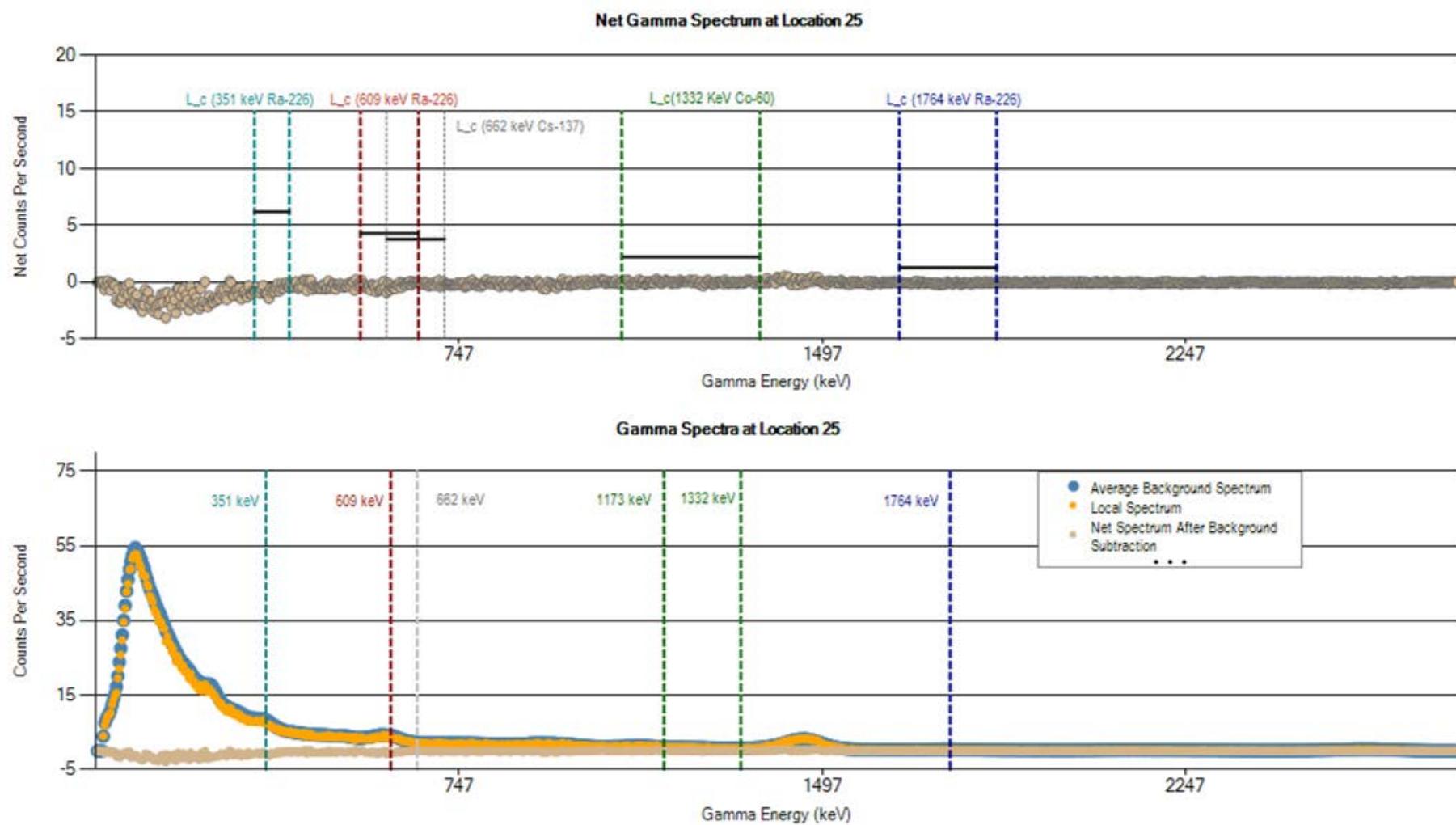
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 22 (cps)	775	119	16	18	137	123	95	156	82	3360
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 23 (cps)	834	125	17	19	146	132	103	167	94	3523
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 24 (cps)	820	120	16	20	141	130	104	163	89	3481
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 25 (cps)	802	120	15	19	140	128	100	159	88	3410
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

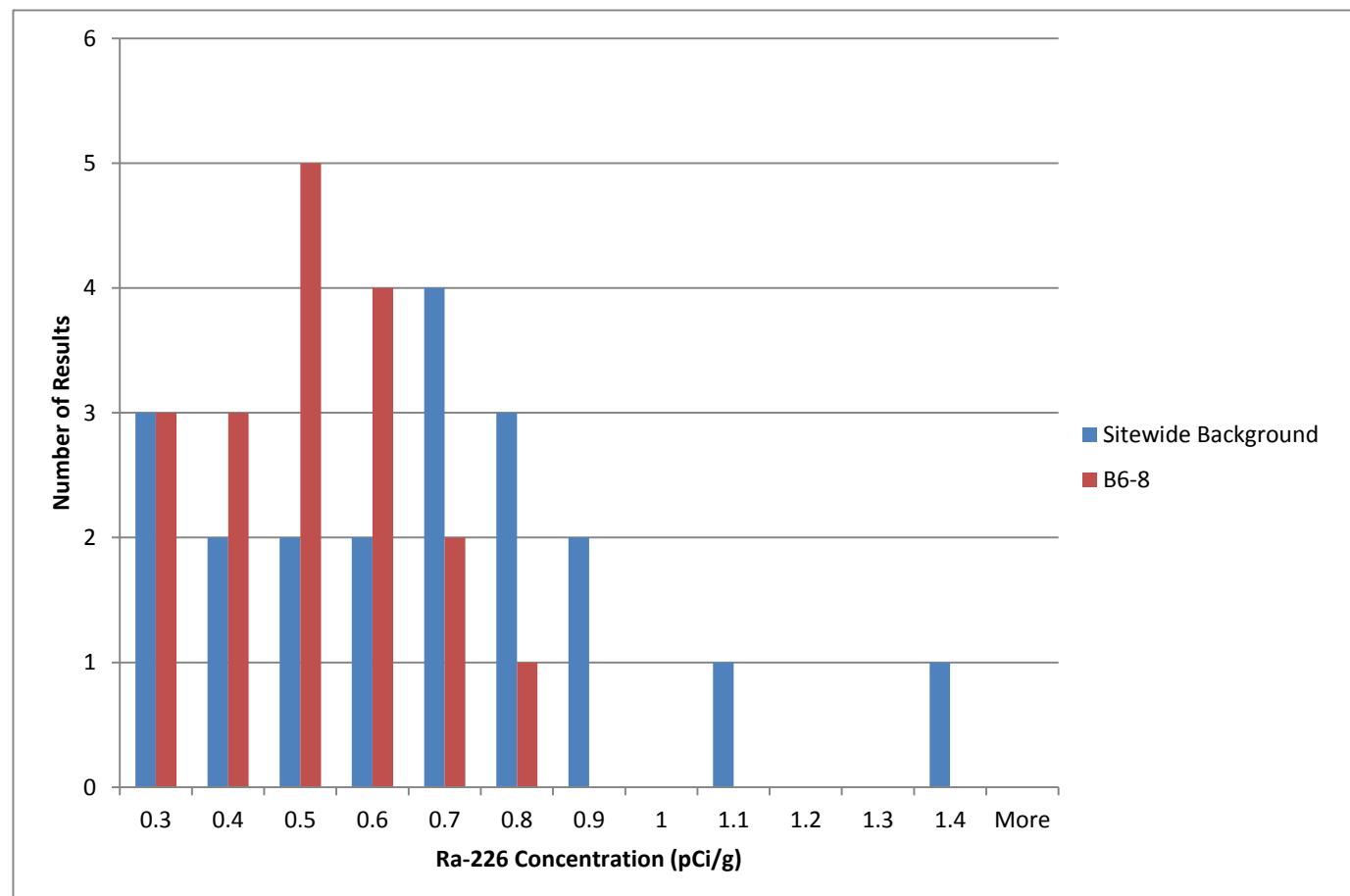
## Histogram, RSY B6 (Use 8) vs. Sitewide Background

## Background

Bin	Frequency
0.3	3
0.4	2
0.5	2
0.6	2
0.7	4
0.8	3
0.9	2
1	0
1.1	1
1.2	0
1.3	0
1.4	1
More	0

## B6-8

Bin	Frequency
0.3	3
0.4	3
0.5	5
0.6	4
0.7	2
0.8	1
0.9	0
1	0
1.1	0
1.2	0
1.3	0
1.4	0
More	0



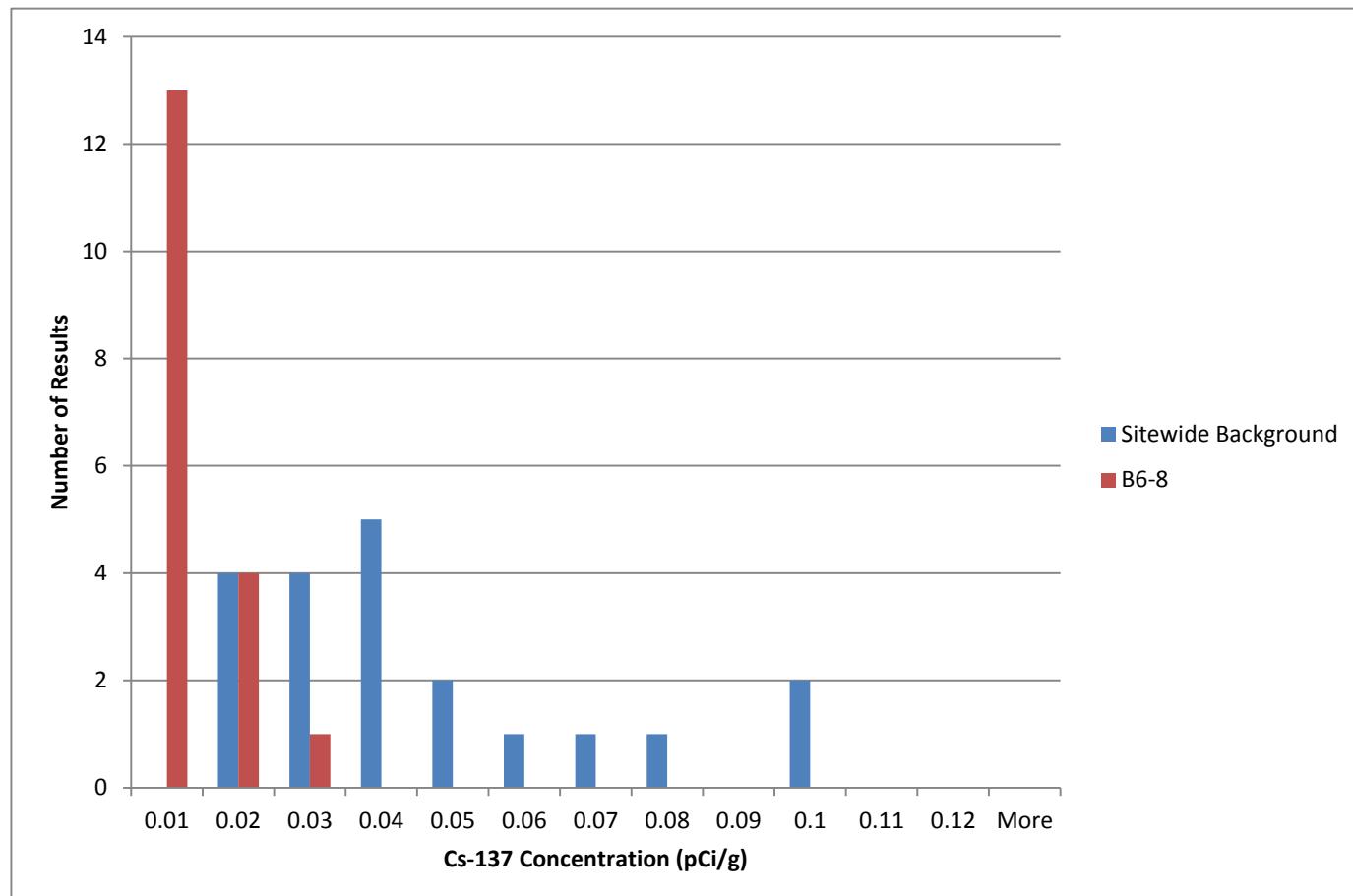
## Histogram, RSY B6 (Use 8) vs. Sitewide Background

## Background

Bin	Frequency
0.01	0
0.02	4
0.03	4
0.04	5
0.05	2
0.06	1
0.07	1
0.08	1
0.09	0
0.1	2
0.11	0
0.12	0
More	0

## B6-8

Bin	Frequency
0.01	13
0.02	4
0.03	1
0.04	0
0.05	0
0.06	0
0.07	0
0.08	0
0.09	0
0.1	0
0.11	0
0.12	0
More	0



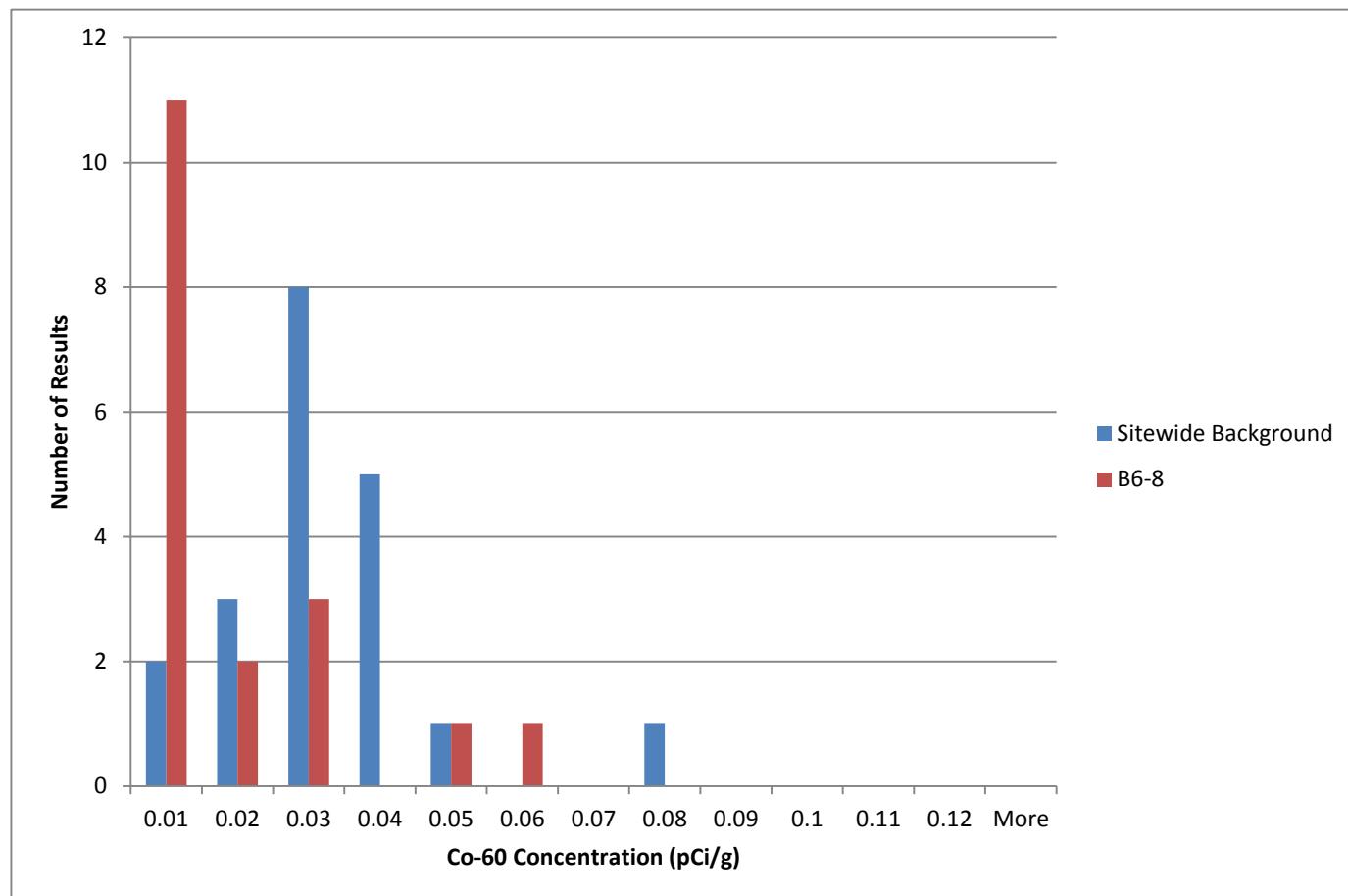
## Histogram, RSY B6 (Use 8) vs. Sitewide Background

## Background

Bin	Frequency
0.01	2
0.02	3
0.03	8
0.04	5
0.05	1
0.06	0
0.07	0
0.08	1
0.09	0
0.1	0
0.11	0
0.12	0
More	0

## B6-8

Bin	Frequency
0.01	11
0.02	2
0.03	3
0.04	0
0.05	1
0.06	1
0.07	0
0.08	0
0.09	0
0.1	0
0.11	0
0.12	0
More	0



# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis  
13715 Rider Trail North  
Earth City, MO 63045  
Tel: (314)298-8566

TestAmerica Job ID: 160-29325-2

Client Project/Site: Hunters Point Naval Shipyard - Parcel E2

For:

Aptim Federal Services LLC  
4005 Port Chicago Hwy, Suite 200  
Concord, California 94520

Attn: Eddie Kalombo

*Rhonda Ridenhower*

Authorized for release by:

8/2/2018 9:27:21 AM

Rhonda Ridenhower, Manager of Project Management  
(314)298-8566

[rhonda.ridenhower@testamericainc.com](mailto:rhonda.ridenhower@testamericainc.com)

### LINKS

Review your project  
results through

**TotalAccess**

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

# Table of Contents

Cover Page .....	1
Table of Contents .....	2
Case Narrative .....	3
Chain of Custody .....	5
Receipt Checklists .....	7
Definitions/Glossary .....	8
Method Summary .....	9
Sample Summary .....	10
Client Sample Results .....	11
QC Sample Results .....	21
QC Association Summary .....	23
Tracer Carrier Summary .....	24

## Case Narrative

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Job ID: 160-29325-2**

**Laboratory: TestAmerica St. Louis**

**Narrative**

### CASE NARRATIVE

**Client: Aptim Federal Services LLC**

**Project: Hunters Point Naval Shipyard - Parcel E2**

**Report Number: 160-29235-2**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client."

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

The following clean-up methods for Organic analyses may have been used on the samples in this data set. Specific methods employed are documented on the batch extraction logs:

Method 3600C: Cleanup

Method 3620C: Florisil Cleanup

Method 3630C: Silica Gel Cleanup

Method 3640A: Gel-Permeation Cleanup

Method 3650B: Acid-Base Partition Cleanup

Method 3660B: Sulfur Cleanup

## Case Narrative

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

### **Job ID: 160-29325-2 (Continued)**

#### **Laboratory: TestAmerica St. Louis (Continued)**

Method 3665A: Sulfuric Acid/Permanganate Cleanup

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

#### **RECEIPT**

The samples were received on 06/27/2018; the samples arrived in good condition, properly preserved. The temperature of the cooler at receipt was 19.0° C.

#### **TOTAL BETA STRONTIUM (GFPC)**

Samples PE2-LF31-FSS-S001 (160-29235-1) and PE2-LF31-FSS-S011 (160-29235-11) were analyzed for Total Beta Strontium (GFPC) in accordance with EPA 905. The samples were dried on 06/28/2018, prepared on 07/02/2018 and analyzed on 07/21/2018.

The following samples could not be thoroughly homogenized before sub-sampling was performed due to sample matrix:

PE2-RSYB6-U8-S001 (160-29325-1) and PE2-RSYB6-U8-S011 (160-29325-11). The samples contained detritus material and rocks of varying sizes.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### **RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)**

Samples PE2-LF31-FSS-S001 (160-29235-1), PE2-LF31-FSS-S002 (160-29235-2), PE2-LF31-FSS-S003 (160-29235-3), PE2-LF31-FSS-S004 (160-29235-4), PE2-LF31-FSS-S005 (160-29235-5), PE2-LF31-FSS-S006 (160-29235-6), PE2-LF31-FSS-S007 (160-29235-7), PE2-LF31-FSS-S008 (160-29235-8), PE2-LF31-FSS-S009 (160-29235-9), PE2-LF31-FSS-S010 (160-29235-10), PE2-LF31-FSS-S011 (160-29235-11), PE2-LF31-FSS-S012 (160-29235-12), PE2-LF31-FSS-S013 (160-29235-13), PE2-LF31-FSS-S014 (160-29235-14), PE2-LF31-FSS-S015 (160-29235-15), PE2-LF31-FSS-S016 (160-29235-16), PE2-LF31-FSS-S017 (160-29235-17) and PE2-LF31-FSS-S018 (160-29235-18) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA\_01\_R. The samples were dried on 06/28/2018, prepared on 07/02/2018 and analyzed on 07/23/2018 and 07/24/2018.

The cesium-137 detection goal of 0.0700 pCi/g was not met. This is caused by statistical fluctuations in the Compton background due to low level activity in the samples in conjunction with the software attempting to fit a peak into the noise of this baseline.

PE2-RSYB6-U8-S001 (160-29325-1), PE2-RSYB6-U8-S005 (160-29325-5), PE2-RSYB6-U8-S007 (160-29325-7), PE2-RSYB6-U8-S010 (160-29325-10), PE2-RSYB6-U8-S015 (160-29325-15), PE2-RSYB6-U8-S016 (160-29325-16) and PE2-RSYB6-U8-S018 (160-29325-18)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



APTIM Federal Services, LLC  
4005 Port Chicago Hwy  
Concord, CA 94520

## CHAIN OF CUSTODY

Ref. Document # PE2 RSYB6 USE8 SH SAND#547  
Page 1 of 2

Project Manager: <b>Nels Johnson</b>	
Send Report To: <b>Eddie Kalombo</b>	
Phone/Fax Number: <b>415-987-0760</b>	
Address: <b>4005 Port Chicago Hwy</b>	
City: Concord, CA, 94520	
Sampler's Name(s): <b>Jedediah Stevens</b>	
Sample Description: <b>Strontium</b>	

Analyses Requested						
Strontium 90 (EPA 905 MOD)						
Total Strontium (EPA 905 MOD)						
Gamma Spec (EPA 1911 M) - (7 day in-Growth preliminary results and full 21 day in-growth for full gamma results)						
Dose Rate μR/Hr						
Strontium 90 (EPA 905 MOD)						
Total Strontium (EPA 905 MOD)						
Gamma Spec (EPA 1911 M) - (7 day in-Growth preliminary results and full 21 day in-growth for full gamma results)						
Dose Rate μR/Hr						
Preservative (water)						
Preservative (soil)						
Container Type						
Sample ID Number	Sample Description	Date	Time	Method	#	#
PE2-RSYB6-U8-S001	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1029	G	SO	1
PE2-RSYB6-U8-S002	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1033	G	SO	1
PE2-RSYB6-U8-S003	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1037	G	SO	1
PE2-RSYB6-U8-S004	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1041	G	SO	1
PE2-RSYB6-U8-S005	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1045	G	SO	1
PE2-RSYB6-U8-S006	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1049	G	SO	1
PE2-RSYB6-U8-S007	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1053	G	SO	1
PE2-RSYB6-U8-S008	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1057	G	SO	1
PE2-RSYB6-U8-S009	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1101	G	SO	1
PE2-RSYB6-U8-S010	Parcel E-2 RSYB6 USE 8 Systematic	7/2/18	1105	G	SO	1

### Special Instructions:

7 days ingrown draft and follow with 21 days final.  
Analyze for Total Strontium as a screening step, and Isotopic Sr-80 only if Total Strontium is above proj...  
....., j.331 pCi/g.

Level Of QC Required:

Standard TAT -10-day	3-day	□ 10-day	I	II	III	Project Specific:			
Reinquished By: <i>J. SABUZI</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Date: 7/2/18	Received By: <i>Kahomao</i>	Date: 7/3/18	Method Codes: <i>Kahomao</i>	C = Composite	G = Grab	
Reinquished By: <i>E. Stevens</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Date: 7/3/18	Received By: <i>Mehdoune</i>	Date: 7/6/18	Matrix Codes: <i>Mehdoune</i>	DW = Drinking Water	SO = Soil	
Reinquished By: <i>J. SABUZI</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Date: 7/6/18	Received By: <i></i>	Date: 7/6/18	Method Codes: <i></i>	GW = Ground Water	SL = Sludge	
Reinquished By: <i>E. Stevens</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Date: 7/6/18	Received By: <i></i>	Date: 7/6/18	Matrix Codes: <i></i>	WW = Waste Water	CP = Chip Samples	
							A = Air	ABS = Asbestos, PO = Pipe Opening	

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12



# CHAIN OF CUSTODY

APTIM Federal Services, LLC

4005 Port Chicago Hwy  
Concord, CA 94520

Ref. Document # PE2\_RSYB6 USE8 SH SAND#547

Page 2 of 2

Analyses Requested									
Total Strontium (EPA 905 MOD)									
Strontium 90 (EPA 905 MOD)									
Gamma Spec (EPA 1911 M) (7 day in-growth preliminary results and final 21 day in-growth full gamma results)									
Dose Rate µR/Hr									
Preservative (water)									
Sample ID Number		Collection Information		Preservative (soil)		N/A		N/A	
Project Number: 500506		Date	Time	Method	Matrix	% Concentration	Container Type		
CTD-013 RSYB6 USE 8 Revetment Spoils Systematic		7/6/18	1109	G	SO	1	16 oz. plastic jar	X	X
Project Name: HPNS - Parcel E-2		7/2/18	1113	G	SO	1	16 oz. plastic jar	X	X
Purchase Order #: 202296		7/2/18	1117	G	SO	1	16 oz. plastic jar	X	X
Shipment/Pickup Date: 7.3.18		7/2/18	1211	G	SO	1	16 oz. plastic jar	X	X
Waybill Number: 12451314932100		7/2/18	1215	G	SO	1	16 oz. plastic jar	X	X
Lab Destination: TestAmerica (St. Louis Lab) 13715 Rider Trail North Bart City, MO 65045		7/2/18	1217	G	SO	1	16 oz. plastic jar	X	X
Lab Contact Name / ph. #: Rhonda Ridenhower (314) 298-8366		7/2/18	1219	G	SO	1	16 oz. plastic jar	X	X
Sampler's Name(s): Eddie Kolumbo		7/2/18	1221	G	SO	1	16 oz. plastic jar	X	X
Phone/Fax Number: 415-987-0760		7/2/18	1223	G	SO	1	16 oz. plastic jar	X	X
Address: 4005 Port Chicago Hwy		7/2/18	1225	G	SO	1	16 oz. plastic jar	X	X
City: Concord, CA, 94520		7/2/18	1227	G	SO	1	16 oz. plastic jar	X	X
7 days Ingrown draft and follow with 21 days final.									
Analyze for Total Strontium as a screening step, and isotopic Sr-90 only if Total Strontium is above project action limit of 0.331 pCi/g.									
Level Of QC Required:									
<input type="checkbox"/> 24-hr	<input type="checkbox"/> 3-day	<input type="checkbox"/> 10-day	I	II	III	Project Specific:			
Reinstituted By: <i>JGA Queen Linnane</i>	Date: 7/1/2018	Received By: <i>K. Dalle</i>	Method Codes: <i>Kalacon 90</i>				Date: 7/2/18	Time: 1100	C = Composite
Reinstituted By: <i>EDDIE KOLUMBO</i>	Date: 7/3/18	Received By: <i>Michelon Piron</i>	Method Codes: <i>904B</i>				Date: 7/5/18	Time: 0948	G = Grab
Reinstituted By: <i>EDDIE KOLUMBO</i>	Date: 7/6/18	Received By: <i>Michelon Piron</i>	Method Codes: <i>904B</i>				Date: 7/6/18	Time: 1045	DW = Drinking Water
Reinstituted By: <i>EDDIE KOLUMBO</i>	Date: 7/6/18	Received By: <i>Michelon Piron</i>	Method Codes: <i>904B</i>				Date: 7/6/18	Time: 1045	GW = Ground Water
Reinstituted By: <i>EDDIE KOLUMBO</i>	Date: 7/6/18	Received By: <i>Michelon Piron</i>	Method Codes: <i>904B</i>				Date: 7/6/18	Time: 1045	WW = Waste Water
A = Air									
ABSS=Asbestos, Po=Pipe Opening									

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12

## Login Sample Receipt Checklist

Client: Aptim Federal Services LLC

Job Number: 160-29325-2

**Login Number: 29325****List Source: TestAmerica St. Louis****List Number: 1****Creator: Press, Nicholas B**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Definitions/Glossary

Client: Aptim Federal Services LLC  
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

### Qualifiers

#### Rad

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

### Glossary

#### Abbreviation

**These commonly used abbreviations may or may not be present in this report.**

□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

## Method Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

Method	Method Description	Protocol	Laboratory
905.0	Total Beta Strontium (GFPC)	DOE	TAL SL
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	TAL SL
DPS-0	Preparation, Digestion/ Precipitate	None	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL

**Protocol References:**

DOE = U.S. Department of Energy

None = None

**Laboratory References:**

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

1

2

3

4

5

6

7

8

9

10

11

12

## Sample Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-29325-1	PE2-RSYB6-U8-S001	Solid	07/02/18 10:29	07/05/18 08:40
160-29325-2	PE2-RSYB6-U8-S002	Solid	07/02/18 10:33	07/05/18 08:40
160-29325-3	PE2-RSYB6-U8-S003	Solid	07/02/18 10:37	07/05/18 08:40
160-29325-4	PE2-RSYB6-U8-S004	Solid	07/02/18 10:41	07/05/18 08:40
160-29325-5	PE2-RSYB6-U8-S005	Solid	07/02/18 10:45	07/05/18 08:40
160-29325-6	PE2-RSYB6-U8-S006	Solid	07/02/18 10:49	07/05/18 08:40
160-29325-7	PE2-RSYB6-U8-S007	Solid	07/02/18 10:53	07/05/18 08:40
160-29325-8	PE2-RSYB6-U8-S008	Solid	07/02/18 10:57	07/05/18 08:40
160-29325-9	PE2-RSYB6-U8-S009	Solid	07/02/18 11:01	07/05/18 08:40
160-29325-10	PE2-RSYB6-U8-S010	Solid	07/02/18 11:05	07/05/18 08:40
160-29325-11	PE2-RSYB6-U8-S011	Solid	07/02/18 11:09	07/05/18 08:40
160-29325-12	PE2-RSYB6-U8-S012	Solid	07/02/18 11:13	07/05/18 08:40
160-29325-13	PE2-RSYB6-U8-S013	Solid	07/02/18 11:17	07/05/18 08:40
160-29325-14	PE2-RSYB6-U8-S014	Solid	07/02/18 12:11	07/05/18 08:40
160-29325-15	PE2-RSYB6-U8-S015	Solid	07/02/18 12:15	07/05/18 08:40
160-29325-16	PE2-RSYB6-U8-S016	Solid	07/02/18 12:19	07/05/18 08:40
160-29325-17	PE2-RSYB6-U8-S017	Solid	07/02/18 12:23	07/05/18 08:40
160-29325-18	PE2-RSYB6-U8-S018	Solid	07/02/18 12:27	07/05/18 08:40

## Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S001**

Date Collected: 07/02/18 10:29

Date Received: 07/05/18 08:40

**Lab Sample ID: 160-29325-1**

Matrix: Solid

**Method: 905.0 - Total Beta Strontium (GFPC)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Total Beta Strontium	0.0112	U	0.0568	0.0568	0.331	0.0456	pCi/g	07/06/18 10:41	07/27/18 07:20	1
<b>Carrier</b>										
Sr Carrier	83.6	U	<b>Limits</b>		40 - 110					

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.644	U	0.227	0.236		0.0448	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Actinium-227	0.210	U	0.736	0.736		0.498	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Bismuth-212	0.00115	U	0.899	0.899		0.741	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Bismuth-214	0.181	U	0.335	0.335		0.243	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Cesium-137	0.0196	U	0.0913	0.0913	0.0700	0.0730	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Cobalt-60	0.00865	U	0.0658	0.0658	0.200	0.0423	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Lead-210	0.523	U	1.32	1.33		0.918	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Lead-212	0.494	U	0.111	0.128		0.0511	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Lead-214	0.426	U	0.132	0.140		0.0506	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Potassium-40	11.3	U	1.92	2.25		0.339	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Protactinium-231	0.735	U	2.34	2.35		2.57	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Radium-226	0.181	U	0.335	0.335	0.700	0.243	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Radium-228	0.644	U	0.227	0.236		0.0448	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Thallium-208	0.144	U	0.0793	0.0807		0.0674	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Thorium-228	0.494	U	0.111	0.128		0.0511	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Thorium-232	0.644	U	0.227	0.236		0.0448	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Thorium-234	-0.119	U	1.28	1.28		1.06	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Uranium-235	-0.209	U	0.553	0.554		0.408	pCi/g	07/08/18 23:09	07/30/18 11:22	1
Uranium-238	-0.119	U	1.28	1.28		1.06	pCi/g	07/08/18 23:09	07/30/18 11:22	1

**Client Sample ID: PE2-RSYB6-U8-S002**

Date Collected: 07/02/18 10:33

Date Received: 07/05/18 08:40

**Lab Sample ID: 160-29325-2**

Matrix: Solid

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.334	U	0.184	0.187		0.159	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Actinium-227	-0.205	U	0.592	0.593		0.380	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Bismuth-212	0.000	U	0.189	0.189		0.517	pCi/g	07/08/18 23:09	07/30/18 11:23	1
<b>Bismuth-214</b>	<b>0.449</b>		0.146	0.153		0.0471	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Cesium-137	-0.0225	U	0.0632	0.0632	0.0700	0.0502	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Cobalt-60	0.0203	U	0.0477	0.0478	0.200	0.0284	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Lead-210	0.0294	U	1.15	1.15		0.944	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Lead-212	0.331	U	0.119	0.126		0.0561	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Lead-214	0.348	U	0.127	0.132		0.0837	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Potassium-40	10.7	U	1.51	1.86		0.226	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Protactinium-231	0.534	U	1.46	1.46		1.64	pCi/g	07/08/18 23:09	07/30/18 11:23	1

# Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S002**

Date Collected: 07/02/18 10:33

Date Received: 07/05/18 08:40

**Lab Sample ID: 160-29325-2**

Matrix: Solid

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Radium-226	0.449		0.146	0.153	0.700	0.0471	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Radium-228	0.334		0.184	0.187		0.159	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Thallium-208	0.166		0.0462	0.0493		0.0123	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Thorium-228	0.331		0.119	0.126		0.0561	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Thorium-232	0.334		0.184	0.187		0.159	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Thorium-234	0.218 U		0.745	0.746		0.535	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Uranium-235	-0.0377 U		0.0827	0.0828		0.332	pCi/g	07/08/18 23:09	07/30/18 11:23	1
Uranium-238	0.218 U		0.745	0.746		0.535	pCi/g	07/08/18 23:09	07/30/18 11:23	1

**Client Sample ID: PE2-RSYB6-U8-S003**

Date Collected: 07/02/18 10:37

Date Received: 07/05/18 08:40

**Lab Sample ID: 160-29325-3**

Matrix: Solid

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.627		0.236	0.244		0.115	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Actinium-227	0.163 U		0.853	0.853		0.695	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Bismuth-212	-0.724 U		0.697	0.701		1.12	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Bismuth-214	0.500		0.135	0.145		0.0418	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Cesium-137	0.00539 U		0.0557	0.0557	0.0700	0.0447	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Cobalt-60	0.0108 U		0.0477	0.0477	0.200	0.0428	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Lead-210	0.234 U		1.61	1.61		1.31	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Lead-212	0.472		0.108	0.124		0.0557	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Lead-214	0.613		0.123	0.138		0.0537	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Potassium-40	10.8		1.73	2.05		0.283	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Protactinium-231	0.000 U		1.07	1.07		2.59	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Radium-226	0.500		0.135	0.145	0.700	0.0418	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Radium-228	0.627		0.236	0.244		0.115	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Thallium-208	0.198		0.0667	0.0698		0.0230	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Thorium-228	0.472		0.108	0.124		0.0557	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Thorium-232	0.627		0.236	0.244		0.115	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Thorium-234	1.36		0.612	0.629		0.761	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Uranium-235	0.0495 U		0.253	0.253		0.435	pCi/g	07/08/18 23:09	07/30/18 11:26	1
Uranium-238	1.36		0.612	0.629		0.761	pCi/g	07/08/18 23:09	07/30/18 11:26	1

**Client Sample ID: PE2-RSYB6-U8-S004**

Date Collected: 07/02/18 10:41

Date Received: 07/05/18 08:40

**Lab Sample ID: 160-29325-4**

Matrix: Solid

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.673		0.236	0.246		0.118	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Actinium-227	-0.443 U		1.23	1.23		0.996	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Bismuth-212	-0.365 U		1.05	1.05		0.834	pCi/g	07/08/18 23:09	07/30/18 12:07	1

**Client Sample Results**

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S004**

Date Collected: 07/02/18 10:41

Date Received: 07/05/18 08:40

**Lab Sample ID: 160-29325-4**

Matrix: Solid

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Bismuth-214	0.611		0.194	0.203		0.0815	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Cesium-137	-0.0273	U	0.0780	0.0781	0.0700	0.0617	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Cobalt-60	0.0136	U	0.0336	0.0337	0.200	0.0483	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Lead-210	1.87		2.09	2.10		1.28	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Lead-212	0.588		0.120	0.134		0.0573	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Lead-214	0.644		0.145	0.159		0.0690	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Potassium-40	12.2		1.74	2.13		0.144	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Protactinium-231	-0.864	U	3.39	3.39		2.76	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Radium-226	0.611		0.194	0.203	0.700	0.0815	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Radium-228	0.673		0.236	0.246		0.118	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Thallium-208	0.310		0.0825	0.0883		0.0207	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Thorium-228	0.588		0.120	0.134		0.0573	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Thorium-232	0.673		0.236	0.246		0.118	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Thorium-234	-0.226	U	1.85	1.85		1.53	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Uranium-235	0.0575	U	0.116	0.116		0.625	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Uranium-238	-0.226	U	1.85	1.85		1.53	pCi/g	07/08/18 23:09	07/30/18 12:07	1

**Client Sample ID: PE2-RSYB6-U8-S005**

Date Collected: 07/02/18 10:45

Date Received: 07/05/18 08:40

**Lab Sample ID: 160-29325-5**

Matrix: Solid

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.411		0.365	0.368		0.177	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Actinium-227	0.324	U	0.359	0.360		0.547	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Bismuth-212	0.253	U	0.889	0.889		0.704	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Lead-214	0.635		0.179	0.191		0.0742	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Cesium-137	-0.0530	U	0.0978	0.0979	0.0700	0.0763	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Cobalt-60	0.0268	U	0.0684	0.0684	0.200	0.0383	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Lead-210	1.16		1.42	1.42		0.938	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Lead-212	0.0159	U	0.180	0.180		0.147	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Lead-214	0.800		0.163	0.183		0.0716	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Potassium-40	11.0		1.81	2.13		0.311	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Protactinium-231	0.776	U	2.39	2.39		1.93	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Radium-226	0.635		0.179	0.191	0.700	0.0742	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Radium-228	0.411		0.365	0.368		0.177	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Thallium-208	0.212		0.0639	0.0675		0.0181	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Thorium-228	0.0159	U	0.180	0.180		0.147	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Thorium-232	0.411		0.365	0.368		0.177	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Thorium-234	-0.109	U	1.44	1.44		1.19	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Uranium-235	0.132	U	0.320	0.321		0.370	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Uranium-238	-0.109	U	1.44	1.44		1.19	pCi/g	07/08/18 23:09	07/30/18 12:06	1

# Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S006**

Date Collected: 07/02/18 10:49

Date Received: 07/05/18 08:40

**Lab Sample ID: 160-29325-6**

Matrix: Solid

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
<b>Actinium 228</b>	<b>0.782</b>		0.219	0.233		0.0530	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Actinium-227	0.0485	U	0.682	0.682		0.470	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Bismuth-212	0.000	U	0.540	0.540		0.850	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Bismuth-214</b>	<b>0.440</b>		0.152	0.158		0.0640	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Cesium-137	-0.0116	U	0.121	0.121	0.0700	0.0576	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Cobalt-60	-0.0198	U	0.0827	0.0827	0.200	0.0410	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Lead-210	1.00	U	1.67	1.67		1.09	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Lead-212</b>	<b>0.482</b>		0.114	0.130		0.0641	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Lead-214</b>	<b>0.605</b>		0.138	0.152		0.0540	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Potassium-40</b>	<b>10.9</b>		1.60	1.95		0.357	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Protactinium-231	0.000	U	0.501	0.501		2.24	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Radium-226</b>	<b>0.440</b>		0.152	0.158	0.700	0.0640	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Radium-228</b>	<b>0.782</b>		0.219	0.233		0.0530	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Thallium-208</b>	<b>0.166</b>		0.0700	0.0721		0.0292	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Thorium-228</b>	<b>0.482</b>		0.114	0.130		0.0641	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Thorium-232</b>	<b>0.782</b>		0.219	0.233		0.0530	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Thorium-234	0.651	U	1.05	1.05		0.814	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Uranium-235</b>	<b>0.232</b>		0.223	0.224		0.114	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Uranium-238	0.651	U	1.05	1.05		0.814	pCi/g	07/08/18 23:09	07/30/18 12:09	1

**Client Sample ID: PE2-RSYB6-U8-S007**

Date Collected: 07/02/18 10:53

Date Received: 07/05/18 08:40

**Lab Sample ID: 160-29325-7**

Matrix: Solid

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
<b>Actinium 228</b>	<b>0.613</b>		0.352	0.358		0.146	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Actinium-227	-0.216	U	1.29	1.29		1.05	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Bismuth-212	0.755	U	1.34	1.34		1.04	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Bismuth-214</b>	<b>0.592</b>		0.206	0.214		0.0830	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Cesium-137	-0.0372	U	0.0967	0.0968	0.0700	0.0763	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Cobalt-60	0.0325	U	0.0862	0.0863	0.200	0.0600	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Lead-210</b>	<b>2.35</b>		2.48	2.50		1.49	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Lead-212</b>	<b>0.602</b>		0.174	0.185		0.0887	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Lead-214</b>	<b>0.734</b>		0.183	0.198		0.0902	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Potassium-40</b>	<b>13.3</b>		2.13	2.52		0.512	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Protactinium-231	0.000	U	0.967	0.967		3.39	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Radium-226</b>	<b>0.592</b>		0.206	0.214	0.700	0.0830	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Radium-228</b>	<b>0.613</b>		0.352	0.358		0.146	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Thallium-208</b>	<b>0.168</b>		0.100	0.102		0.0472	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Thorium-228</b>	<b>0.602</b>		0.174	0.185		0.0887	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Thorium-232</b>	<b>0.613</b>		0.352	0.358		0.146	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Thorium-234</b>	<b>1.09</b>		0.718	0.728		0.997	pCi/g	07/08/18 23:09	07/30/18 12:06	1
Uranium-235	0.0294	U	0.0894	0.0895		0.696	pCi/g	07/08/18 23:09	07/30/18 12:06	1
<b>Uranium-238</b>	<b>1.09</b>		0.718	0.728		0.997	pCi/g	07/08/18 23:09	07/30/18 12:06	1

# Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S008****Lab Sample ID: 160-29325-8**

Date Collected: 07/02/18 10:57

Matrix: Solid

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
<b>Actinium 228</b>	<b>0.576</b>		0.198	0.206		0.0395	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Actinium-227	0.270	U	0.898	0.898		0.727	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Bismuth-212	-0.0419	U	0.823	0.823		0.830	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Bismuth-214</b>	<b>0.629</b>		0.145	0.159		0.0329	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Cesium-137	0.00565	U	0.0661	0.0661	0.0700	0.0534	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Cobalt-60</b>	<b>0.0292</b>		0.0432	0.0433	0.200	0.0261	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Lead-210	0.835	U	1.69	1.69		1.35	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Lead-212</b>	<b>0.394</b>		0.0953	0.108		0.0445	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Lead-214</b>	<b>0.520</b>		0.121	0.133		0.0509	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Potassium-40</b>	<b>11.8</b>		1.85	2.21		0.297	pCi/g	07/08/18 23:09	07/30/18 12:07	1
Protactinium-231	0.000	U	0.438	0.438		2.41	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Radium-226</b>	<b>0.629</b>		0.145	0.159	0.700	0.0329	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Radium-228</b>	<b>0.576</b>		0.198	0.206		0.0395	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Thallium-208</b>	<b>0.188</b>		0.0593	0.0625		0.0171	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Thorium-228</b>	<b>0.394</b>		0.0953	0.108		0.0445	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Thorium-232</b>	<b>0.576</b>		0.198	0.206		0.0395	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Thorium-234</b>	<b>1.31</b>		0.719	0.732		0.908	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Uranium-235</b>	<b>0.383</b>		0.227	0.230		0.137	pCi/g	07/08/18 23:09	07/30/18 12:07	1
<b>Uranium-238</b>	<b>1.31</b>		0.719	0.732		0.908	pCi/g	07/08/18 23:09	07/30/18 12:07	1

**Client Sample ID: PE2-RSYB6-U8-S009****Lab Sample ID: 160-29325-9**

Date Collected: 07/02/18 11:01

Matrix: Solid

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
<b>Actinium 228</b>	<b>0.353</b>		0.283	0.286		0.151	pCi/g	07/08/18 23:09	07/30/18 12:08	1
Actinium-227	0.149	U	0.431	0.431		0.602	pCi/g	07/08/18 23:09	07/30/18 12:08	1
Bismuth-212	-0.574	U	1.06	1.07		0.836	pCi/g	07/08/18 23:09	07/30/18 12:08	1
<b>Bismuth-214</b>	<b>0.503</b>		0.147	0.156		0.0524	pCi/g	07/08/18 23:09	07/30/18 12:08	1
Cesium-137	0.0184	U	0.0377	0.0377	0.0700	0.0280	pCi/g	07/08/18 23:09	07/30/18 12:08	1
Cobalt-60	0.00573	U	0.0570	0.0570	0.200	0.0327	pCi/g	07/08/18 23:09	07/30/18 12:08	1
Lead-210	0.143	U	1.44	1.44		1.17	pCi/g	07/08/18 23:09	07/30/18 12:08	1
<b>Lead-212</b>	<b>0.360</b>		0.0989	0.109		0.0609	pCi/g	07/08/18 23:09	07/30/18 12:08	1
<b>Lead-214</b>	<b>0.582</b>		0.122	0.137		0.0405	pCi/g	07/08/18 23:09	07/30/18 12:08	1
<b>Potassium-40</b>	<b>9.19</b>		1.64	1.89		0.404	pCi/g	07/08/18 23:09	07/30/18 12:08	1
Protactinium-231	0.223	U	1.37	1.37		2.12	pCi/g	07/08/18 23:09	07/30/18 12:08	1
<b>Radium-226</b>	<b>0.503</b>		0.147	0.156	0.700	0.0524	pCi/g	07/08/18 23:09	07/30/18 12:08	1
<b>Radium-228</b>	<b>0.353</b>		0.283	0.286		0.151	pCi/g	07/08/18 23:09	07/30/18 12:08	1
<b>Thallium-208</b>	<b>0.161</b>		0.0762	0.0780		0.0349	pCi/g	07/08/18 23:09	07/30/18 12:08	1
<b>Thorium-228</b>	<b>0.360</b>		0.0989	0.109		0.0609	pCi/g	07/08/18 23:09	07/30/18 12:08	1
<b>Thorium-232</b>	<b>0.353</b>		0.283	0.286		0.151	pCi/g	07/08/18 23:09	07/30/18 12:08	1
Thorium-234	-0.394	U	1.19	1.19		0.996	pCi/g	07/08/18 23:09	07/30/18 12:08	1
Uranium-235	0.0472	U	0.172	0.172		0.180	pCi/g	07/08/18 23:09	07/30/18 12:08	1
Uranium-238	-0.394	U	1.19	1.19		0.996	pCi/g	07/08/18 23:09	07/30/18 12:08	1

# Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S010****Lab Sample ID: 160-29325-10**

Matrix: Solid

Date Collected: 07/02/18 11:05

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
<b>Actinium 228</b>	<b>0.835</b>		0.314	0.325		0.134	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Actinium-227	0.365	U	0.812	0.813		0.540	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Bismuth-212	0.000	U	0.227	0.227		0.649	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Bismuth-214	0.286	U	0.213	0.215		0.295	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Cesium-137	-0.0792	U	0.190	0.191	0.0700	0.108	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Cobalt-60</b>	<b>0.0609</b>		0.0487	0.0491	0.200	0.0235	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Lead-210	-0.291	U	2.13	2.13		1.52	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Lead-212</b>	<b>0.716</b>		0.138	0.166		0.0465	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Lead-214</b>	<b>0.511</b>		0.145	0.154		0.0724	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Potassium-40</b>	<b>10.6</b>		2.15	2.40		0.444	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Protactinium-231	-0.0000003	U	3.54	3.54		2.92	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Radium-226	0.286	U	0.213	0.215	0.700	0.295	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Radium-228</b>	<b>0.835</b>		0.314	0.325		0.134	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Thallium-208</b>	<b>0.360</b>		0.112	0.118		0.0363	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Thorium-228</b>	<b>0.716</b>		0.138	0.166		0.0465	pCi/g	07/08/18 23:09	07/30/18 12:09	1
<b>Thorium-232</b>	<b>0.835</b>		0.314	0.325		0.134	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Thorium-234	0.896	U	0.776	0.782		1.31	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Uranium-235	0.0939	U	0.237	0.238		0.406	pCi/g	07/08/18 23:09	07/30/18 12:09	1
Uranium-238	0.896	U	0.776	0.782		1.31	pCi/g	07/08/18 23:09	07/30/18 12:09	1

**Client Sample ID: PE2-RSYB6-U8-S011****Lab Sample ID: 160-29325-11**

Matrix: Solid

Date Collected: 07/02/18 11:09

Date Received: 07/05/18 08:40

**Method: 905.0 - Total Beta Strontium (GFPC)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
<b>Total Beta Strontium</b>	<b>0.0632</b>		0.0562	0.0563	0.331	0.0404	pCi/g	07/06/18 10:41	07/27/18 07:20	1
<b>Carrier</b>	%Yield	Qualifier	Limits							
Sr Carrier	97.0		40 - 110							
								Prepared	Analyzed	Dil Fac
								07/06/18 10:41	07/27/18 07:20	1

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
<b>Actinium 228</b>	<b>0.585</b>		0.181	0.190		0.0994	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Actinium-227	-0.122	U	0.744	0.744		0.607	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Bismuth-212	-0.279	U	0.731	0.732		0.580	pCi/g	07/08/18 23:09	07/30/18 12:48	1
<b>Bismuth-214</b>	<b>0.492</b>		0.109	0.121		0.0351	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Cesium-137	-0.0392	U	0.0464	0.0466	0.0700	0.0481	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Cobalt-60	-0.0114	U	0.0782	0.0782	0.200	0.0343	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Lead-210	0.673	U	1.29	1.29		1.03	pCi/g	07/08/18 23:09	07/30/18 12:48	1
<b>Lead-212</b>	<b>0.502</b>		0.0916	0.112		0.0433	pCi/g	07/08/18 23:09	07/30/18 12:48	1
<b>Lead-214</b>	<b>0.512</b>		0.103	0.116		0.0522	pCi/g	07/08/18 23:09	07/30/18 12:48	1
<b>Potassium-40</b>	<b>10.8</b>		1.41	1.80		0.275	pCi/g	07/08/18 23:09	07/30/18 12:48	1

# Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S011****Lab Sample ID: 160-29325-11**

Date Collected: 07/02/18 11:09

Matrix: Solid

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Protactinium-231	-0.768	U	2.54	2.54		2.07	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Radium-226	<b>0.492</b>		0.109	0.121	0.700	0.0351	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Radium-228	<b>0.585</b>		0.181	0.190		0.0994	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Thallium-208	<b>0.163</b>		0.0518	0.0545		0.0194	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Thorium-228	<b>0.502</b>		0.0916	0.112		0.0433	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Thorium-232	<b>0.585</b>		0.181	0.190		0.0994	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Thorium-234	0.534	U	1.28	1.28		1.03	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Uranium-235	-0.00540	U	0.0876	0.0876		0.354	pCi/g	07/08/18 23:09	07/30/18 12:48	1
Uranium-238	0.534	U	1.28	1.28		1.03	pCi/g	07/08/18 23:09	07/30/18 12:48	1

**Client Sample ID: PE2-RSYB6-U8-S012****Lab Sample ID: 160-29325-11**

Date Collected: 07/02/18 11:13

Matrix: Solid

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	<b>0.666</b>		0.173	0.186		0.0595	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Actinium-227	0.314	U	0.535	0.537		0.686	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Bismuth-212	-0.690	U	1.20	1.20		0.939	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Bismuth-214	0.135	U	0.172	0.173		0.216	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Cesium-137	-0.0507	U	0.0863	0.0865	0.0700	0.0670	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Cobalt-60	-0.0681	U	0.136	0.136	0.200	0.0647	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Lead-210	-1.02	U	2.32	2.32		1.94	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Lead-212	<b>0.491</b>		0.117	0.128		0.0645	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Lead-214	<b>0.569</b>		0.146	0.157		0.0708	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Potassium-40	<b>11.6</b>		1.65	2.02		0.137	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Protactinium-231	0.922	U	2.33	2.34		2.56	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Radium-226	0.135	U	0.172	0.173	0.700	0.216	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Radium-228	<b>0.666</b>		0.173	0.186		0.0595	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Thallium-208	<b>0.212</b>		0.0849	0.0876		0.0310	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Thorium-228	<b>0.491</b>		0.117	0.128		0.0645	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Thorium-232	<b>0.666</b>		0.173	0.186		0.0595	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Thorium-234	-0.0201	U	0.0613	0.0613		1.58	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Uranium-235	0.210	U	0.482	0.482		0.445	pCi/g	07/08/18 23:09	07/30/18 12:50	1
Uranium-238	-0.0201	U	0.0613	0.0613		1.58	pCi/g	07/08/18 23:09	07/30/18 12:50	1

**Client Sample ID: PE2-RSYB6-U8-S013****Lab Sample ID: 160-29325-13**

Date Collected: 07/02/18 11:17

Matrix: Solid

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	<b>0.799</b>		0.191	0.208		0.0878	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Actinium-227	-0.138	U	0.864	0.864		0.499	pCi/g	07/08/18 23:09	07/30/18 12:49	1

# Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S013****Lab Sample ID: 160-29325-13**

Date Collected: 07/02/18 11:17

Matrix: Solid

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Bismuth-212	-0.687	U	1.13	1.14		0.867	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Bismuth-214</b>	<b>0.668</b>		0.159	0.174		0.0516	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Cesium-137	0.0336	U	0.0767	0.0768	0.0700	0.0598	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Cobalt-60	-0.0130	U	0.147	0.147	0.200	0.0531	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Lead-210	1.10	U	1.82	1.83		1.25	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Lead-212</b>	<b>0.613</b>		0.130	0.153		0.0688	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Lead-214</b>	<b>0.590</b>		0.157	0.169		0.0678	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Potassium-40</b>	<b>12.8</b>		1.93	2.34		0.308	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Protactinium-231	0.387	U	1.73	1.73		2.75	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Radium-226</b>	<b>0.668</b>		0.159	0.174	0.700	0.0516	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Radium-228</b>	<b>0.799</b>		0.191	0.208		0.0878	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Thallium-208</b>	<b>0.230</b>		0.0900	0.0931		0.0363	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Thorium-228</b>	<b>0.613</b>		0.130	0.153		0.0688	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Thorium-232</b>	<b>0.799</b>		0.191	0.208		0.0878	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Thorium-234	-0.601	U	1.73	1.74		1.23	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Uranium-235	-0.0387	U	0.111	0.111		0.342	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Uranium-238	-0.601	U	1.73	1.74		1.23	pCi/g	07/08/18 23:09	07/30/18 12:49	1

**Client Sample ID: PE2-RSYB6-U8-S014****Lab Sample ID: 160-29325-14**

Date Collected: 07/02/18 12:11

Matrix: Solid

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
<b>Actinium 228</b>	<b>0.769</b>		0.188	0.203		0.130	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Actinium-227	-0.141	U	0.937	0.937		0.642	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Bismuth-212	0.252	U	0.583	0.584		0.442	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Bismuth-214</b>	<b>0.526</b>		0.176	0.184		0.0697	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Cesium-137	-0.0491	U	0.103	0.103	0.0700	0.0692	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Cobalt-60</b>	<b>0.0501</b>		0.0354	0.0358	0.200	0.0146	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Lead-210	1.14	U	1.79	1.79		1.17	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Lead-212</b>	<b>0.621</b>		0.126	0.150		0.0618	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Lead-214</b>	<b>0.680</b>		0.166	0.180		0.0714	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Potassium-40</b>	<b>11.9</b>		1.81	2.18		0.414	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Protactinium-231	0.315	U	1.62	1.62		2.51	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Radium-226</b>	<b>0.526</b>		0.176	0.184	0.700	0.0697	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Radium-228</b>	<b>0.769</b>		0.188	0.203		0.130	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Thallium-208</b>	<b>0.187</b>		0.0676	0.0703		0.0276	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Thorium-228</b>	<b>0.621</b>		0.126	0.150		0.0618	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Thorium-232</b>	<b>0.769</b>		0.188	0.203		0.130	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Thorium-234	0.841	U	1.25	1.26		0.972	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Uranium-235	-0.00659	U	0.0107	0.0107		0.399	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Uranium-238	0.841	U	1.25	1.26		0.972	pCi/g	07/08/18 23:09	07/30/18 12:49	1

# Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S015****Lab Sample ID: 160-29325-15**

Date Collected: 07/02/18 12:15

Matrix: Solid

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.814		0.309	0.320		0.0925	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Actinium-227	-0.465	U	1.19	1.19		0.960	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Bismuth-212	-0.0406	U	1.23	1.23		1.01	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Bismuth-214</b>	<b>0.767</b>		0.193	0.208		0.0651	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Cesium-137	0.0193	U	0.104	0.104	0.0700	0.0843	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Cobalt-60	-0.00241	U	0.115	0.115	0.200	0.0568	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Lead-210</b>	<b>1.25</b>		1.89	1.89		1.25	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Lead-212</b>	<b>0.598</b>		0.135	0.148		0.0701	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Lead-214</b>	<b>0.735</b>		0.153	0.170		0.0651	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Potassium-40</b>	<b>12.7</b>		2.02	2.39		0.485	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Protactinium-231	0.464	U	3.81	3.81		3.12	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Radium-226</b>	<b>0.767</b>		0.193	0.208	0.700	0.0651	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Radium-228</b>	<b>0.814</b>		0.309	0.320		0.0925	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Thallium-208</b>	<b>0.289</b>		0.0809	0.0861		0.0196	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Thorium-228</b>	<b>0.598</b>		0.135	0.148		0.0701	pCi/g	07/08/18 23:09	07/30/18 12:49	1
<b>Thorium-232</b>	<b>0.814</b>		0.309	0.320		0.0925	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Thorium-234	-0.0222	U	1.91	1.91		1.57	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Uranium-235	0.251	U	0.550	0.551		0.682	pCi/g	07/08/18 23:09	07/30/18 12:49	1
Uranium-238	-0.0222	U	1.91	1.91		1.57	pCi/g	07/08/18 23:09	07/30/18 12:49	1

**Client Sample ID: PE2-RSYB6-U8-S016****Lab Sample ID: 160-29325-16**

Date Collected: 07/02/18 12:19

Matrix: Solid

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.543		0.401	0.405		0.193	pCi/g	07/08/18 23:09	07/30/18 12:51	1
Actinium-227	0.238	U	0.652	0.652		0.757	pCi/g	07/08/18 23:09	07/30/18 12:51	1
Bismuth-212	0.321	U	0.817	0.818		0.636	pCi/g	07/08/18 23:09	07/30/18 12:51	1
<b>Bismuth-214</b>	<b>0.485</b>		0.148	0.156		0.0542	pCi/g	07/08/18 23:09	07/30/18 12:51	1
Cesium-137	-0.0523	U	0.0855	0.0856	0.0700	0.0733	pCi/g	07/08/18 23:09	07/30/18 12:51	1
Cobalt-60	0.0135	U	0.0818	0.0818	0.200	0.0455	pCi/g	07/08/18 23:09	07/30/18 12:51	1
Lead-210	-0.210	U	2.26	2.26		1.47	pCi/g	07/08/18 23:09	07/30/18 12:51	1
<b>Lead-212</b>	<b>0.526</b>		0.113	0.132		0.0548	pCi/g	07/08/18 23:09	07/30/18 12:51	1
<b>Lead-214</b>	<b>0.529</b>		0.122	0.134		0.0534	pCi/g	07/08/18 23:09	07/30/18 12:51	1
<b>Potassium-40</b>	<b>12.8</b>		1.93	2.33		0.300	pCi/g	07/08/18 23:09	07/30/18 12:51	1
Protactinium-231	0.0350	U	3.15	3.15		2.59	pCi/g	07/08/18 23:09	07/30/18 12:51	1
<b>Radium-226</b>	<b>0.485</b>		0.148	0.156	0.700	0.0542	pCi/g	07/08/18 23:09	07/30/18 12:51	1
<b>Radium-228</b>	<b>0.543</b>		0.401	0.405		0.193	pCi/g	07/08/18 23:09	07/30/18 12:51	1
<b>Thallium-208</b>	<b>0.234</b>		0.0654	0.0698		0.0173	pCi/g	07/08/18 23:09	07/30/18 12:51	1
<b>Thorium-228</b>	<b>0.526</b>		0.113	0.132		0.0548	pCi/g	07/08/18 23:09	07/30/18 12:51	1
<b>Thorium-232</b>	<b>0.543</b>		0.401	0.405		0.193	pCi/g	07/08/18 23:09	07/30/18 12:51	1
Thorium-234	-0.304	U	1.78	1.78		1.48	pCi/g	07/08/18 23:09	07/30/18 12:51	1
Uranium-235	0.0488	U	0.133	0.133		0.466	pCi/g	07/08/18 23:09	07/30/18 12:51	1
Uranium-238	-0.304	U	1.78	1.78		1.48	pCi/g	07/08/18 23:09	07/30/18 12:51	1

# Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Client Sample ID: PE2-RSYB6-U8-S017****Lab Sample ID: 160-29325-17**

Matrix: Solid

Date Collected: 07/02/18 12:23

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+-)	(2σ+-)						
<b>Actinium 228</b>	<b>0.616</b>		0.173	0.184		0.0342	pCi/g	07/08/18 23:09	07/30/18 12:53	1
Actinium-227	0.301	U	0.728	0.728		0.585	pCi/g	07/08/18 23:09	07/30/18 12:53	1
Bismuth-212	0.343	U	0.579	0.580		0.430	pCi/g	07/08/18 23:09	07/30/18 12:53	1
<b>Bismuth-214</b>	<b>0.429</b>		0.112	0.120		0.0261	pCi/g	07/08/18 23:09	07/30/18 12:53	1
Cesium-137	0.0190	U	0.0610	0.0611	0.0700	0.0483	pCi/g	07/08/18 23:09	07/30/18 12:53	1
Cobalt-60	0.0249	U	0.0718	0.0719	0.200	0.0339	pCi/g	07/08/18 23:09	07/30/18 12:53	1
Lead-210	-0.221	U	1.54	1.54		1.28	pCi/g	07/08/18 23:09	07/30/18 12:53	1
<b>Lead-212</b>	<b>0.472</b>		0.107	0.123		0.0618	pCi/g	07/08/18 23:09	07/30/18 12:53	1
<b>Lead-214</b>	<b>0.635</b>		0.133	0.148		0.0389	pCi/g	07/08/18 23:09	07/30/18 12:53	1
<b>Potassium-40</b>	<b>10.7</b>		1.65	1.98		0.270	pCi/g	07/08/18 23:09	07/30/18 12:53	1
Protactinium-231	0.570	U	1.78	1.79		1.96	pCi/g	07/08/18 23:09	07/30/18 12:53	1
<b>Radium-226</b>	<b>0.429</b>		0.112	0.120	0.700	0.0261	pCi/g	07/08/18 23:09	07/30/18 12:53	1
<b>Radium-228</b>	<b>0.616</b>		0.173	0.184		0.0342	pCi/g	07/08/18 23:09	07/30/18 12:53	1
<b>Thallium-208</b>	<b>0.191</b>		0.0620	0.0651		0.0211	pCi/g	07/08/18 23:09	07/30/18 12:53	1
<b>Thorium-228</b>	<b>0.472</b>		0.107	0.123		0.0618	pCi/g	07/08/18 23:09	07/30/18 12:53	1
<b>Thorium-232</b>	<b>0.616</b>		0.173	0.184		0.0342	pCi/g	07/08/18 23:09	07/30/18 12:53	1
Thorium-234	-0.0536	U	1.12	1.12		0.920	pCi/g	07/08/18 23:09	07/30/18 12:53	1
Uranium-235	-0.154	U	0.439	0.439		0.404	pCi/g	07/08/18 23:09	07/30/18 12:53	1
Uranium-238	-0.0536	U	1.12	1.12		0.920	pCi/g	07/08/18 23:09	07/30/18 12:53	1

**Client Sample ID: PE2-RSYB6-U8-S018****Lab Sample ID: 160-29325-18**

Matrix: Solid

Date Collected: 07/02/18 12:27

Date Received: 07/05/18 08:40

**Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)**

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+-)	(2σ+-)						
<b>Actinium 228</b>	<b>0.801</b>		0.227	0.241		0.0558	pCi/g	07/08/18 23:09	07/30/18 12:55	1
Actinium-227	-0.230	U	0.658	0.659		0.561	pCi/g	07/08/18 23:09	07/30/18 12:55	1
Bismuth-212	0.000	U	0.215	0.215		0.813	pCi/g	07/08/18 23:09	07/30/18 12:55	1
<b>Bismuth-214</b>	<b>0.710</b>		0.202	0.215		0.0661	pCi/g	07/08/18 23:09	07/30/18 12:55	1
Cesium-137	-0.0316	U	0.0806	0.0807	0.0700	0.0822	pCi/g	07/08/18 23:09	07/30/18 12:55	1
Cobalt-60	0.0105	U	0.144	0.144	0.200	0.0735	pCi/g	07/08/18 23:09	07/30/18 12:55	1
Lead-210	0.764	U	1.39	1.39		0.996	pCi/g	07/08/18 23:09	07/30/18 12:55	1
<b>Lead-212</b>	<b>0.574</b>		0.135	0.154		0.0642	pCi/g	07/08/18 23:09	07/30/18 12:55	1
<b>Lead-214</b>	<b>0.624</b>		0.178	0.189		0.0649	pCi/g	07/08/18 23:09	07/30/18 12:55	1
<b>Potassium-40</b>	<b>13.8</b>		2.37	2.76		0.421	pCi/g	07/08/18 23:09	07/30/18 12:55	1
Protactinium-231	-1.43	U	3.64	3.64		2.93	pCi/g	07/08/18 23:09	07/30/18 12:55	1
<b>Radium-226</b>	<b>0.710</b>		0.202	0.215	0.700	0.0661	pCi/g	07/08/18 23:09	07/30/18 12:55	1
<b>Radium-228</b>	<b>0.801</b>		0.227	0.241		0.0558	pCi/g	07/08/18 23:09	07/30/18 12:55	1
<b>Thallium-208</b>	<b>0.236</b>		0.0801	0.0837		0.0214	pCi/g	07/08/18 23:09	07/30/18 12:55	1
<b>Thorium-228</b>	<b>0.574</b>		0.135	0.154		0.0642	pCi/g	07/08/18 23:09	07/30/18 12:55	1
<b>Thorium-232</b>	<b>0.801</b>		0.227	0.241		0.0558	pCi/g	07/08/18 23:09	07/30/18 12:55	1
Thorium-234	-1.64	U	1.63	1.64		1.62	pCi/g	07/08/18 23:09	07/30/18 12:55	1
Uranium-235	0.322	U	0.316	0.318		0.329	pCi/g	07/08/18 23:09	07/30/18 12:55	1
Uranium-238	-1.64	U	1.63	1.64		1.62	pCi/g	07/08/18 23:09	07/30/18 12:55	1

# QC Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

## Method: 905.0 - Total Beta Strontium (GFPC)

Lab Sample ID: MB 160-374243/15-A

Matrix: Solid

Analysis Batch: 378220

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 374243

Analyte	MB	MB	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Total Beta Strontium	0.04830		0.0614	0.0615	0.331	0.0465	pCi/g	07/06/18 10:41	07/27/18 07:23	1
<i>Carrier</i>	<i>MB</i>	<i>MB</i>								
<i>Sr Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>		<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
	92.4			40 - 110				07/06/18 10:41	07/27/18 07:23	1

Lab Sample ID: LCS 160-374243/1-A

Matrix: Solid

Analysis Batch: 378547

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 374243

Analyte	MB	MB	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	%Rec.	Limits
	Result	Qualifier									
Total Beta Strontium			8.22	8.680		0.689	0.331	0.0438	pCi/g	106	75 - 125
<i>Carrier</i>	<i>LCS</i>	<i>LCS</i>									
<i>Sr Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>		<i>Limits</i>							
	94.0			40 - 110							

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-374422/1-A

Matrix: Solid

Analysis Batch: 378612

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 374422

Analyte	MB	MB	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Actinium-227	0.1410	U	0.221	0.222		0.248	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Bismuth-212	0.0000	U	0.0810	0.0810		0.0944	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Bismuth-214	-0.05047	U	0.0878	0.0880		0.131	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Cesium-137	0.001035	U	0.0590	0.0590	0.0700	0.0485	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Cobalt-60	0.01217	U	0.0396	0.0396	0.200	0.0280	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Lead-210	0.2354	U	1.02	1.02		0.821	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Lead-212	-0.03617	U	0.0782	0.0783		0.0619	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Lead-214	-0.0000725	U	0.0625	0.0625		0.0508	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Potassium-40	0.002156	U	0.703	0.703		0.422	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Protactinium-231	0.0000	U	0.529	0.529		1.28	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Radium-226	-0.05047	U	0.0878	0.0880	0.700	0.131	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Thallium-208	0.006431	U	0.0160	0.0160		0.0299	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Thorium-228	-0.03617	U	0.0782	0.0783		0.0619	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Thorium-234	-0.3049	U	1.02	1.02		0.821	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Uranium-235	0.1193	U	0.245	0.245		0.255	pCi/g	07/08/18 23:09	07/30/18 14:59	1
Uranium-238	-0.3049	U	1.02	1.02		0.821	pCi/g	07/08/18 23:09	07/30/18 14:59	1

# QC Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

## Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

**Lab Sample ID: MB 160-374422/1-A**
**Matrix: Solid****Analysis Batch: 378611**
**Client Sample ID: Method Blank**
**Prep Type: Total/NA****Prep Batch: 374422**

Analyte	MB	MB	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium-228	0.1025	U	0.208	0.208		0.129	pCi/g	07/08/18 23:09	07/30/18 22:05	1
Radium-228	0.1025	U	0.208	0.208		0.129	pCi/g	07/08/18 23:09	07/30/18 22:05	1
Thorium-232	0.1025	U	0.208	0.208		0.129	pCi/g	07/08/18 23:09	07/30/18 22:05	1

**Lab Sample ID: LCS 160-374422/2-A**
**Matrix: Solid****Analysis Batch: 378611**
**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA****Prep Batch: 374422**

Analyte	Spike	LCS	LCS	Total	LOQ	DLC	Unit	%Rec	Limits	%Rec.
	Added	Result	Qual	Uncert. (2σ+/-)						
Americium-241	96.8	96.62		11.4		0.643	pCi/g	100	87 - 116	
Cesium-137	28.2	30.86		3.24	0.0700	0.132	pCi/g	109	87 - 120	
Cobalt-60	12.9	13.56		1.41	0.200	0.0927	pCi/g	105	87 - 115	

**Lab Sample ID: 160-29325-1 DU**
**Matrix: Solid****Analysis Batch: 378612**
**Client Sample ID: PE2-RSYB6-U8-S001**
**Prep Type: Total/NA****Prep Batch: 374422**

Analyte	Sample	Sample	DU	DU	Total	LOQ	DLC	Unit	RER	Limit
	Result	Qual	Result	Qual	Uncert. (2σ+/-)					
Actinium-228	0.644		0.3709		0.218		0.0930	pCi/g	0.60	1
Actinium-227	0.210	U	0.09830	U	0.255		0.573	pCi/g	0.11	1
Bismuth-212	0.00115	U	0.5242	U	1.00		0.797	pCi/g	0.27	1
Bismuth-214	0.181	U	0.5125		0.131		0.0441	pCi/g	0.71	1
Cesium-137	0.0196	U	-0.03404	U	0.0380	0.0700	0.0492	pCi/g	0.41	1
Cobalt-60	0.00865	U	0.02408	U	0.0201	0.200	0.0321	pCi/g	0.18	1
Lead-210	0.523	U	-0.7471	U	1.65		1.33	pCi/g	0.43	1
Lead-212	0.494		0.4303		0.0982		0.0371	pCi/g	0.28	1
Lead-214	0.426		0.5752		0.133		0.0420	pCi/g	0.55	1
Potassium-40	11.3		11.39		1.82		0.258	pCi/g	0.02	1
Protactinium-231	0.735	U	0.0000	U	0.829		2.31	pCi/g	0.23	1
Radium-226	0.181	U	0.5125		0.131	0.700	0.0441	pCi/g	0.71	1
Radium-228	0.644		0.3709		0.218		0.0930	pCi/g	0.60	1
Thallium-208	0.144		0.1802		0.0487		0.0110	pCi/g	0.28	1
Thorium-228	0.494		0.4303		0.0982		0.0371	pCi/g	0.28	1
Thorium-232	0.644		0.3709		0.218		0.0930	pCi/g	0.60	1
Thorium-234	-0.119	U	0.5997	U	1.28		1.03	pCi/g	0.28	1
Uranium-235	-0.209	U	-0.04661	U	0.0946		0.358	pCi/g	0.25	1
Uranium-238	-0.119	U	0.5997	U	1.28		1.03	pCi/g	0.28	1

# QC Association Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Rad****Leach Batch: 374102**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29325-1	PE2-RSYB6-U8-S001	Total/NA	Solid	Dry and Grind	
160-29325-2	PE2-RSYB6-U8-S002	Total/NA	Solid	Dry and Grind	
160-29325-3	PE2-RSYB6-U8-S003	Total/NA	Solid	Dry and Grind	
160-29325-4	PE2-RSYB6-U8-S004	Total/NA	Solid	Dry and Grind	
160-29325-5	PE2-RSYB6-U8-S005	Total/NA	Solid	Dry and Grind	
160-29325-6	PE2-RSYB6-U8-S006	Total/NA	Solid	Dry and Grind	
160-29325-7	PE2-RSYB6-U8-S007	Total/NA	Solid	Dry and Grind	
160-29325-8	PE2-RSYB6-U8-S008	Total/NA	Solid	Dry and Grind	
160-29325-9	PE2-RSYB6-U8-S009	Total/NA	Solid	Dry and Grind	
160-29325-10	PE2-RSYB6-U8-S010	Total/NA	Solid	Dry and Grind	
160-29325-11	PE2-RSYB6-U8-S011	Total/NA	Solid	Dry and Grind	
160-29325-12	PE2-RSYB6-U8-S012	Total/NA	Solid	Dry and Grind	
160-29325-13	PE2-RSYB6-U8-S013	Total/NA	Solid	Dry and Grind	
160-29325-14	PE2-RSYB6-U8-S014	Total/NA	Solid	Dry and Grind	
160-29325-15	PE2-RSYB6-U8-S015	Total/NA	Solid	Dry and Grind	
160-29325-16	PE2-RSYB6-U8-S016	Total/NA	Solid	Dry and Grind	
160-29325-17	PE2-RSYB6-U8-S017	Total/NA	Solid	Dry and Grind	
160-29325-18	PE2-RSYB6-U8-S018	Total/NA	Solid	Dry and Grind	
160-29325-1 DU	PE2-RSYB6-U8-S001	Total/NA	Solid	Dry and Grind	

**Prep Batch: 374243**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29325-1	PE2-RSYB6-U8-S001	Total/NA	Solid	DPS-0	374102
160-29325-11	PE2-RSYB6-U8-S011	Total/NA	Solid	DPS-0	374102
MB 160-374243/15-A	Method Blank	Total/NA	Solid	DPS-0	
LCS 160-374243/1-A	Lab Control Sample	Total/NA	Solid	DPS-0	

**Prep Batch: 374422**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-29325-1	PE2-RSYB6-U8-S001	Total/NA	Solid	Fill_Geo-21	374102
160-29325-2	PE2-RSYB6-U8-S002	Total/NA	Solid	Fill_Geo-21	374102
160-29325-3	PE2-RSYB6-U8-S003	Total/NA	Solid	Fill_Geo-21	374102
160-29325-4	PE2-RSYB6-U8-S004	Total/NA	Solid	Fill_Geo-21	374102
160-29325-5	PE2-RSYB6-U8-S005	Total/NA	Solid	Fill_Geo-21	374102
160-29325-6	PE2-RSYB6-U8-S006	Total/NA	Solid	Fill_Geo-21	374102
160-29325-7	PE2-RSYB6-U8-S007	Total/NA	Solid	Fill_Geo-21	374102
160-29325-8	PE2-RSYB6-U8-S008	Total/NA	Solid	Fill_Geo-21	374102
160-29325-9	PE2-RSYB6-U8-S009	Total/NA	Solid	Fill_Geo-21	374102
160-29325-10	PE2-RSYB6-U8-S010	Total/NA	Solid	Fill_Geo-21	374102
160-29325-11	PE2-RSYB6-U8-S011	Total/NA	Solid	Fill_Geo-21	374102
160-29325-12	PE2-RSYB6-U8-S012	Total/NA	Solid	Fill_Geo-21	374102
160-29325-13	PE2-RSYB6-U8-S013	Total/NA	Solid	Fill_Geo-21	374102
160-29325-14	PE2-RSYB6-U8-S014	Total/NA	Solid	Fill_Geo-21	374102
160-29325-15	PE2-RSYB6-U8-S015	Total/NA	Solid	Fill_Geo-21	374102
160-29325-16	PE2-RSYB6-U8-S016	Total/NA	Solid	Fill_Geo-21	374102
160-29325-17	PE2-RSYB6-U8-S017	Total/NA	Solid	Fill_Geo-21	374102
160-29325-18	PE2-RSYB6-U8-S018	Total/NA	Solid	Fill_Geo-21	374102
MB 160-374422/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-374422/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-29325-1 DU	PE2-RSYB6-U8-S001	Total/NA	Solid	Fill_Geo-21	374102

**Tracer/Carrier Summary**

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-29325-2

**Method: 905.0 - Total Beta Strontium (GFPC)****Matrix: Solid****Prep Type: Total/NA****Percent Yield (Acceptance Limits)**

<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Sr Carrier (40-110)</b>										
160-29325-1	PE2-RSYB6-U8-S001	83.6										
160-29325-11	PE2-RSYB6-U8-S011	97.0										
LCS 160-374243/1-A	Lab Control Sample	94.0										
MB 160-374243/15-A	Method Blank	92.4										

**Tracer/Carrier Legend**

Sr Carrier = Sr Carrier

1

2

3

4

5

6

7

8

9

10

11

12